

portable

100/200

FOR USERS OF TANDY BRIEFCASE COMPUTERS

BUG BUSTER

A debugging program
for your 100 or 200

FLYING PORTABLES

Flying question still
in airlines' laps

LEARNING THE BASICS

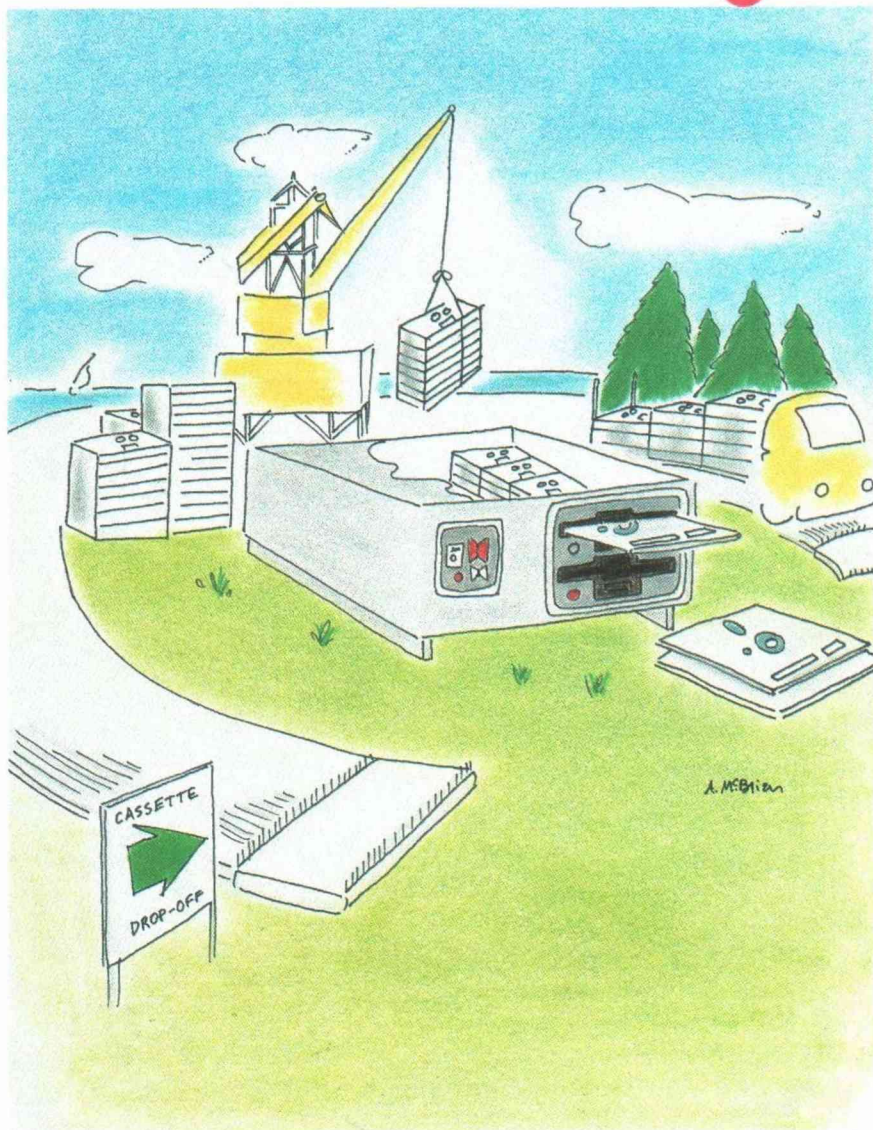
Bolster your BASIC
confidence

SUPER ORGANIZER

For big mail lists

SUNDAY BRUNCH

On the SIG

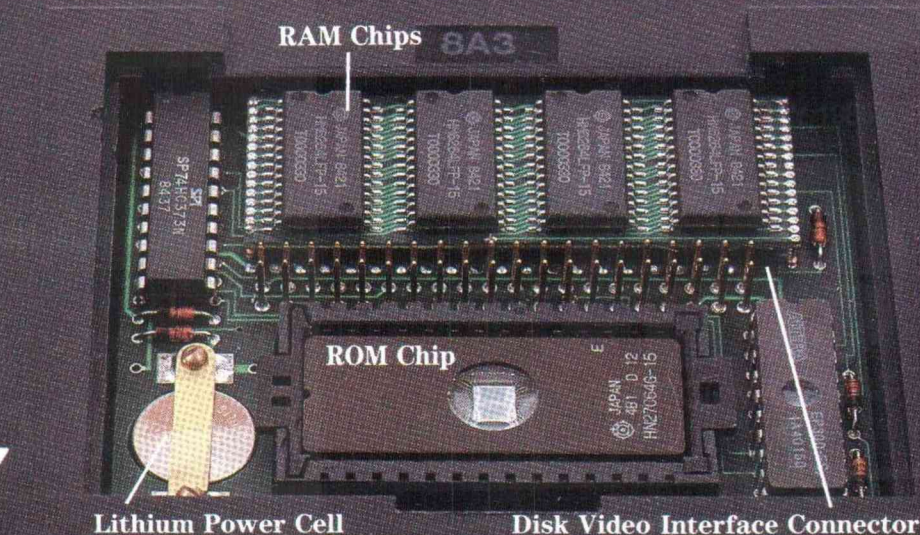


CHIPMUNK VS. PIC DISC: MAKING THE CHOICE

100 users no longer chained to desk-tops



State of The Art RAM Technology

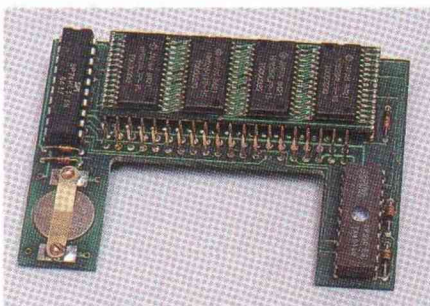


At last, a 96K Model 100!

"The new PG Design RAM should be in every Model 100 built!"

Miniaturized Technology

Our miniaturized RAM chips are state of the art. They are the most advanced memory chips found anywhere in the world. Their tiny size allows us to keep a low profile in the expansion port of the Model 100. We use a technique called *vapor phase soldering* to ensure that each and every tiny connection is clean — perfect.



The RAM module is precision constructed.

Like The Original

Each 32K RAM bank has its own command of the software that comes in your Model 100. BASIC, TEXT, TEL-COM, ADDR55, SCHEDL are all there in each bank and you can use them as you would in the original bank. Each bank can be accessed from any of the other banks. We even have an optional data transfer program

which allows data to be transferred from one bank to any other bank. It's flawless!

Simple Installation

"Adding this 64K RAM module to your Model 100 is as easy as putting in new batteries." Once you've removed the expansion cover on the back of your Model 100, just snap the **PG Design** RAM module in. You can't get it wrong! The pins line up perfectly with the expansion holes in the Model 100 compartment. Snap the cover back on and turn your Model 100 over. Turn it on and enter BASIC. Type in the one line program we supply you and presto—you've got a Model 100 with 96K of RAM. You do not need a 32K Model 100 to utilize the **PG Design** 64K RAM module.

No Need To Remove It

The beauty of this RAM module is that we've enabled you to have a Model 100 with 96K of RAM and we've given you access to the other Model 100 options within the expansion compartment. The DVI connection can be made easily with our rugged connectors. Gone are the flat flimsy pins. And best of all, the ROM slot is clear to insert any ROM modules, (like Tandy's Multiplan on ROM). We designed this RAM module so it wouldn't ever have to be removed from your Model 100. But, if you should remove it, we've installed a lithium

power cell that will keep all the data on the module intact for six months outside the Model 100. Six months! The actual life span of the lithium power cell while in the Model 100 is nearly six years!

Guarantee

We stand behind all the products we manufacture at **PG Design**. If you are not completely satisfied with your purchase, call us! If we cannot solve your problem, return the product to us and we will refund your money. We are positive that you will be completely satisfied with all our products.

Order Today

64K RAM module — \$375

32K RAM module — \$250

If you want only a 32K version of the RAM module, you may upgrade later for only \$150. The 32K version is constructed exactly as the 64K module.

Data Transfer Program — call

Call us at 313/727-2744, or write. We accept Visa and MasterCard, as well as check or money orders. We ship within five days of receiving your order.

Dealer Prices Available

TRS-80 is a trade mark of Radio Shack

PG DESIGN ELECTRONICS, INC. Micro-Computer Peripherals

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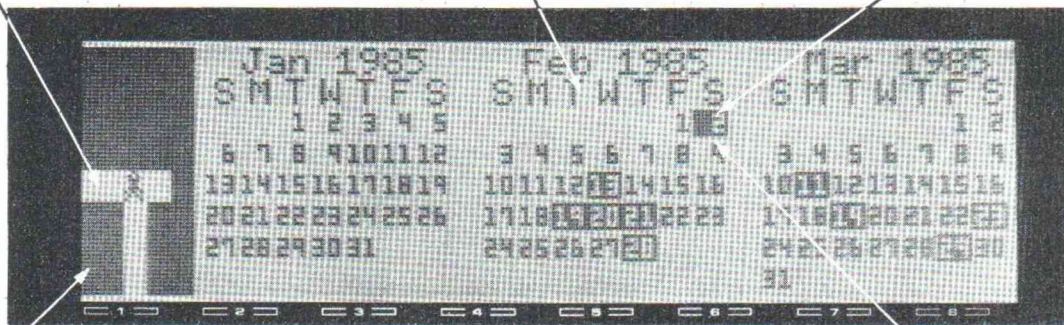
"It's about time someone wrote this software."

We've done it with TMPC (The Most Precious Commodity)

Exclusive *Floor Plan interface

Fast machine language program displays calendars in 1/2 second

Current day flashes, and can be changed with arrow keys



Fourteen other screens handle projects, print diaries, and monitor files

Appointments for indicated day displayed with a single keystroke

Your TRS-80 Model 100 probably saves you time already. So why not use it to *manage* your time? The **TMPC** software from Acroatrix transforms your Model 100 into a command center for appointments and projects.

More than a Calendar

Your Model 100 deserves more than a simple-minded replacement of a date book. The **TMPC** is designed around principles from Stephanie Winston's *The Organized Executive*, a popular self-improvement guide for anyone who wants to be better organized. Every **TMPC** feature has been carefully designed and tested to work for you.

Interested? Ask for our free demonstration program today. If you have a modem cable, we will

send it over the phone (see the box); the call takes about five minutes. Otherwise, send us \$3.00 for handling and we'll send a cassette with the sample. Discover the old-fashioned value in **TMPC's** space age design, and you'll agree that, "It's about time someone wrote this software."

TMPC by Acroatrix
\$49.95 + \$3.00 shipping
Phone orders call
1-800-448-4511 Ext. (353)
NY 1-800-962-1480 Ext. (353)
(operators take orders only)



COD orders accepted

AUTO LOG-ON PROGRAM FOR:

Free Sample

```
10 P$="16176575422"+
   "<==^D^D?1tmpc^M?s>"
20 M=VARPTR(P$)
30 A=PEEK(M+1)+256*PEEK(M+2)
40 CALL 21200
50 CALL 21293,0,A
60 LOAD "MDM:8N1D",R
```

Note: Before running this program, connect your Model 100 to a telephone with the Radio Shack modem cable (see page 76 of the owners manual). Set TELCOM status to M8N1D.

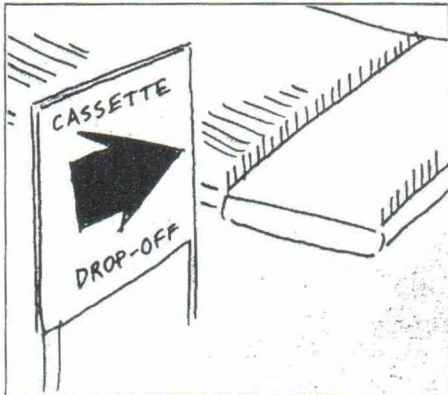
Massachusetts residents must remove the area code in line 10.

Ac'ro·ă'tix Incorporated
P.O. Box 273 Wilmington, MA 01887

portable

100/200 VOLUME TWO NUMBER TEN 1985

COVER STORY



CHIPMUNK VS. PIC DISC: MAKING THE CHOICE14

By John P. Mello Jr.

Lack of a truly portable disk drive has kept Model 100 chained to the desk-top. Now two firms proffer solutions.

Cover and feature illustration by Andy McBrian

ARTICLES

FLYING PORTABLES IN LAPS OF AIRLINES 'TIL FAA LANDS A DECISION 6

By William O'Connell

Wade through the muck and mire of what each airline is saying? Here's an update from commercial air carriers around the world.

A SUPER ORGANIZER FOR LARGE SCALE LISTS19

By Richard Ramella

If you depend on direct mail, Magnalist becomes a versatile information manager.



AUTO PROGRAM — PART 10: HERE COME 'DA BUG BUSTER.....31

By David D. Busch

A debugging program for your 100 or 200.

LEARNING THE BASICS34

By Danny Goodman

Bolster your BASIC with this introductory lesson.

DEPARTMENTS

ROM WITH A VIEW	3
MAIL 100/200.....	4
FULL-DUPLEX.....	10
SIG 100/200.....	12
THE WIRE	29
USER GROUPS	48
ADVERTISERS INDEX.....	53
NEW PRODUCTS.....	55
REVIEWS.....	56

portable 100/200

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ROM WITH A VIEW

No single event has enhanced the function of the Model 100 and blurred the distinction between the lap computer and its desk-top cousins more than the arrival of portable disk drives for the Model 100.

Hitherto, probably half the universe of Model 100 owners regarded their mighty-mite as a "second" computer to the desk-top. Likewise, some portion of the first-time buyers group that might have purchased a 100 — but instead chose a popular desk-top — did so for the same reason: cute little computer, but no match for a "real" micro.

Storage (more properly, the lack thereof) and the infuriating non-functionality of (most) cassette drives were two big drawbacks to the little powerhouse. Radio Shack's Disk/Video Interface was the first long step in the right direction. But it was of the Howard Johnson's variety — slow, cold and too expensive for what you got.

Now, along come the Chipmunk and the PIC Disc. As former Portable 100 editor John Mello, who reviewed and compared the disk drives for this issue, says "...for anyone enthusiastic about the future of the Model 100, (one of these) is a must-get peripheral. The future of the 100 is inescapably linked to it." Nuff said.

In the misfire zone, we 'fess up to an error in judgement. Program listings are essential to the readers of this magazine. We just plain ran out of room last month, so we cut out a lengthy listing. We tried to make sure that photocopies or cassettes of listings were available by return mail, or could be accessed from the Model 100 SIG on CompuServe.

Our rationale was that if we could avoid lengthy programs in these few precious pages, we could fill them with more useful programming articles and make the accompanying listings readily available. Specious thinking. We now are wiser by some.

But henceforth, readers are assured the program listings will run in the same issue with the pertinent article. It remains our hope that we can run two or three good programming stories per issue, but that readers will avail themselves of our SIG service. Beginning in April, our table of contents is also available on the SIG.

Additionally, readers may have noticed the announcement of our newest newsletter: The Portable Program Review, available in both hardcopy and cassette. It is to be a useful source of public domain software programs, along with brief review notes and tips.

Readers are encouraged to submit articles to be considered for publication, particularly programming pieces. Short utilities and the like are most welcome. We prefer to get hardcopy manuscript and either cassette or data disk. If we don't use the piece, we'll return the software. If we do use it, we'll pay you for it.

In the kudos to you and us department, here's the way the Whole Earth Software Catalog gave the Model 100 and this magazine mention:

"We recommend the...Model 100 over its close competition, the NEC 8201, primarily because of its on-board modem and good telecommunications and the fact that the 100 has more support.

"...There's an excellent online support group for the Model 100 on CompuServe with a large library of downloadable software, including some quite usable utilities.

"There's an intriguing monthly magazine (Portable 100/200). The hacker action around this machine reminds me of early Apple IIs." To which we say, aw, shucks.

BAT

Bruce A. Taylor



A. McBrien

AMPI: LEAVE MY SPACE ALONE

The following letter reflects confusion many 100 users have encountered. Journalist, by American Micro Products (AMPI), can not run simultaneously with the Radio Shack Disk/Video Interface (DVI).

Apparently readers such as Dr. Gill have been under the misconception that Journalist and the DVI can work together. AMPI's Robert Gahl has kindly clarified the problem in his response.
—Ed.

I recently purchased Journalist for my 100. I'm very dissatisfied with the program. It's not compatible with Radio Shack's DVI. I can't load the cassette when the disk operating system is loaded, and must cold start the machine to load the program, thus losing all stored files. Without the DOS loaded I can't take data from floppy to print via the program since the DOS must be cleared to load Journalist.

Is there a solution? Radio Shack was unable to tell me how to clear the DOS from memory. Do you know? Or do you know how to clear Journalist from memory without performing a cold start? Without these answers I can't use the program.

Mark A. Gill
Los Angeles, CA

Your problem is a common one for anyone who owns the DVI and attempts to run an average assembly-language program. The DVI uses the high portion of random-access memory (RAM).

This is accomplished by moving a "fence" known as MAXRAM down into a lower portion of memory. When authors, such as myself, write assembly-language programs we generally place it as high in memory as possible. This enables the program to require less user memory.

This is where the conflict arises. Both systems are competing for the same area. When this happens something has to give. In this case it was the DVI.

For any cassette loading assembly-language program to be compatible with the DVI, or any assembly-language program, the memory conflict must be

resolved. To make Journalist compatible with the DVI would require moving the starting address of the program down to a lower memory location. That's not a problem.

The problem is that instead of only requiring 6K of memory to run Journalist, you'd lose the 6K used by Journalist plus whatever is required by the DVI. Although this is possible, the DVI is owned by less than 5 percent of our market ... too few to justify a special DVI version of Journalist.

Quite honestly, this isn't financially feasible for us. The numbers aren't there to support the additional expense of two versions.

We at American Micro Products are aware of the conflict between the DVI and Journalist. For this reason we try to screen all incoming calls to prevent a problem such as yours from happening. If you return the package in saleable condition we'll gladly refund your money.

Robert Gahl, Vice President
American Micro Products

New Format Receives Mixed Reviews

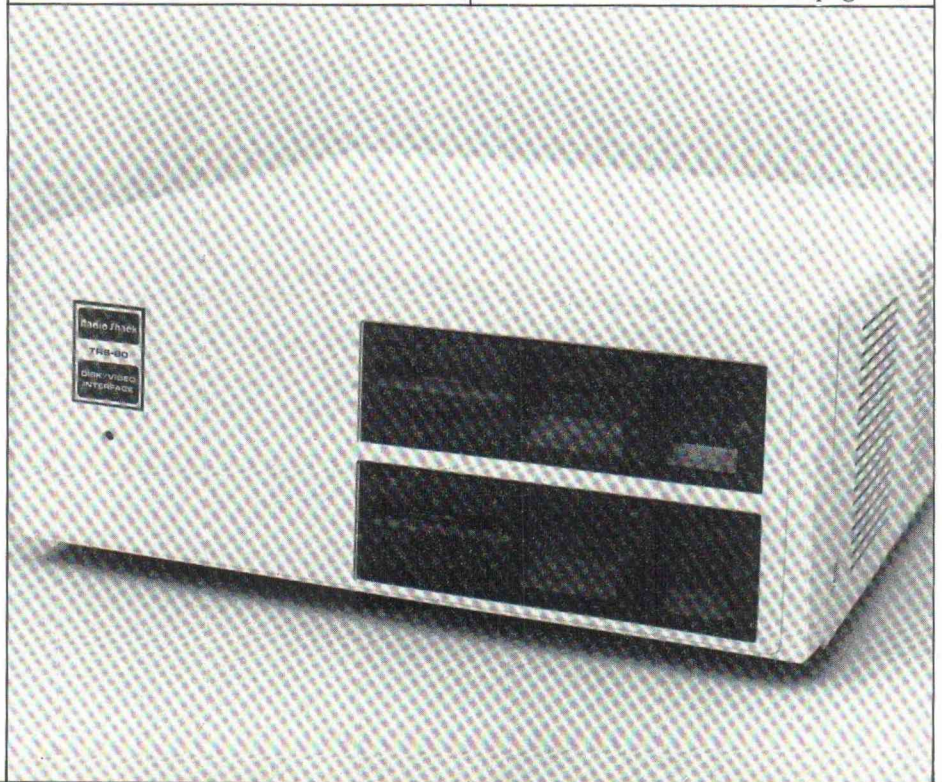
Don't change the magazine! The previous format was plenty contemporary. The smaller type font lets you put more words per page, but it's less readable. And those vertical lines in the program listings have got to go. They obscure listings rather than enhance them.

In spite of the less readable text, I did enjoy the content of your March issue.

Jeff Davidson
CIS 76010,3233

My March issue of Portable 100/200 arrived today and I was surprised at the new format. While I like the print style, I am very unhappy with the program and table listings. The listings appear to be on pajama material and are

(continued on page 26)



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Only Text Power 100™ has Page Plot.™ At a glance you can see the full format of every page before printing.

Include the make of your printer with your order.
Text Power 100™ works with parallel printers only.
Include \$10.00 for each additional printer.
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Name _____

Street _____

City _____ State _____ Zip _____

Phone _____ Master/Visa Card No. _____ Exp. Date _____

Computer _____ Signature _____

Who says size doesn't count?

From the software ads around here, you might get the impression that your portable computer can store the knowledge of the universe. But it can't. That's why you need to know just how big the software is. Or how small.

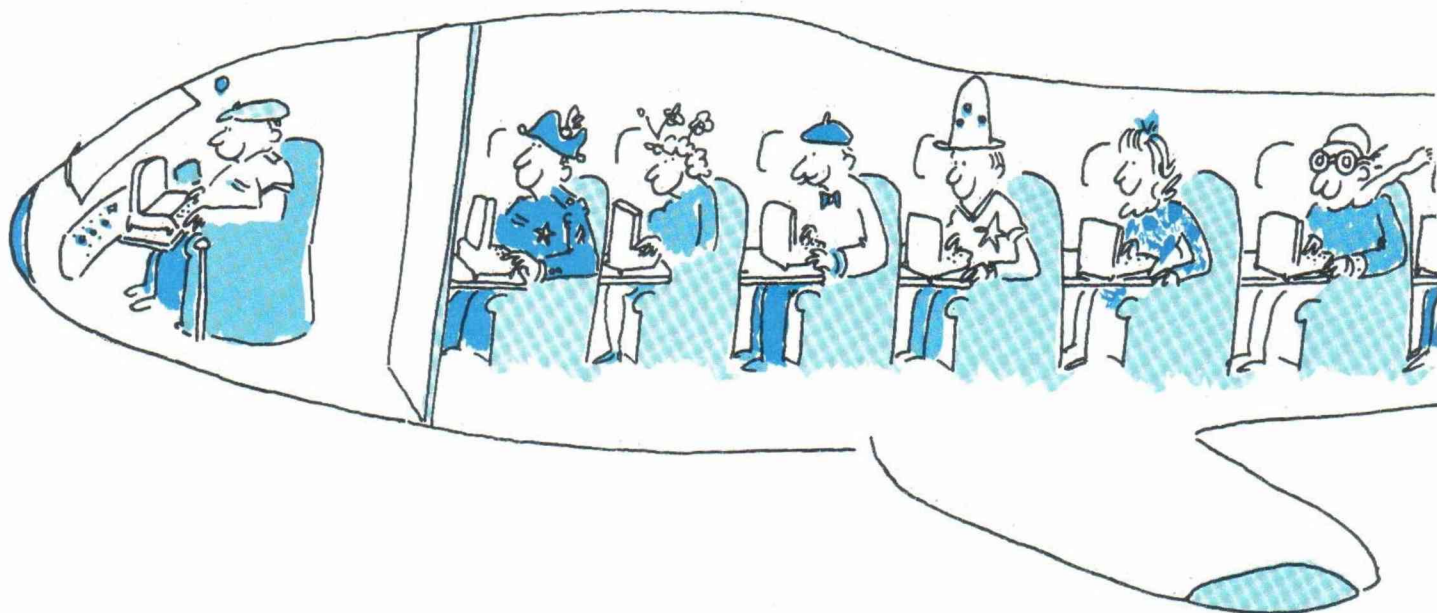
Keep this in memory: Text Power 100™ is 2,500 bytes long. Elf-writer (by Ceres Software) is 10,000 bytes long. Write + (by Portable Computer Support Group) is 3.5K. The Traveling Writer™ (by Traveling Software) is 5000 bytes. When our competitors' ads don't tell you how big their programs are, they're trying to tell you something.

Size is just one advantage of our 100 percent machine-language code. The other is speed. Text Power 100™ formats faster than you can imagine. Faster than all of the competition's products working in parallel. Fast enough to format the Bible in 12 minutes. Right-justified.

Text Power 100™ features: Page Plot.™ merge text, edit mode, label printing, page numbering, formatted preview mode, parameter/file memory, right justification, footers, headers, internal format controls, page length, top margin, bottom margin, left margin, right margin, double/single spacing, vertical center, horizontal center, page break display, new page command, full printer customization and more.

Text Power 100.™ For the Model 100, Olivetti M10 and NEC PC-8201A. \$49.95 plus \$2.00 shipping. Available exclusively from The Covington Group/310 Riverside Drive, Suite 916, New York City, NY 10025/212 678-0064, 864-1700.

TEXT POWER 100



To help readers wade through the muck and mire of what each airline is saying, here's an update garnered from commercial air carriers around the world.

By William O'Connell

Are portable computers safe to use in-flight? How about during take-offs and landings? The Federal Aviation Administration (FAA) has promised to release a ruling this summer...but don't hold your breath. Based on joint findings by researchers of both the FAA and Radio Technical Commission for Aeronautics (RTCA), the study will be published by the FAA in an Advisory circular.

At last, what most portable users have assumed will be formalized: portable computers and other portable electronic devices are safe for use in-flight.

However, the ruling will insist that portable electronic devices not be used during takeoffs and landings "... to provide an extra margin of safety ..."

Until the FAA's circular is released, each airline may issue its own decree. No carrier is required to authorize the use of portable computers on board. —Ed.

Wait and see is Pan Am's policy. Until an FAA ruling is adopted "...Pan Am will abide by any ruling the FAA makes in this regard," said the company's system director of public relations, James Arey. For now, portable computers are treated as stowable hand baggage and their in-flight use isn't allowed on Pan Am planes.

One of the first to prohibit the use of portables, Eastern Airlines recently relaxed its policy. According to Bill Stevens, Eastern's vice president of flight operation and safety, "we allow the use of the following electronic devices: hand-held electronic games; portable self-controlled, battery-powered computers; portable recording typewriter units; hand-held calculators; portable voice recorders; hearing aids; heart pacemakers; and electric shavers."

tain a complete ban. "We have a policy that we do not allow portable computers to be used on board our aircraft," said Morris Simoncelli, public relations manager of Japan Air Lines in a recent phone conversation.

"If they're something you want to carry on and put in the overhead rack, you may," Simoncelli said, "but don't take it down and put it in your lap and start typing away."

"Ours are mostly long, over-water flights," he added. "And we're going over that very critical flight path — the portion between Alaska and Tokyo. We're not about to stray over into the Russian territory."

Another airline which has long over-water flights, although in less hostile surroundings, is British Airways. "(We've

LOOK BUT DON'T TOUCH

Although Japan Air Lines reported no in-air problems with portables, they main-



FLYING PORTABLES

In Laps of Airlines 'Til FAA Lands a Decision

tested and done some research on the carriage of portable computers in the cabin of aircraft and found that there is no effect on any navigational equipment or the electronics of the aircraft," said public affairs manager Mr. Lampl. "Therefore, we have no problems in the transportation of small portable computers or their operation in the flight-cabin."

FLIGHT CREWS AT ATTENTION

World Airways, Inc. is giving a cautious okay to the in-flight use of portables. FAA liaison manager Thomas Ray stated that their flight crews remain alert to possible problems caused by the portables. If the cockpit crew noticed anything amiss, they'd "immediately ask the flight attendant if 'someone back there is using a prohibited item' — an electronic item." He hastened to add that "so far, we have not had any of that."

Scandinavian Airlines System (SAS) "has not tested, nor do we plan or feel the need for testing, the personal computers now in operation," said their info manager. "We have not documented any problems caused by the use of portable computers," he said. SAS treats portables as hand-carried baggage and allows their use in the passenger cabin.

American Airlines wants to run tests and prohibits the use of some portables until a conclusion is reached. According to W.E. Crosby, vice president of passenger services, "American has conducted extensive tests on computer equipment and has found prohibitions necessary to be applied only to computer devices with remote controls or data entry pads with umbilical cord attach-

ments." American also bans the use of electronic games with remote controls.

PORTABLE STOW-AWAYS

American and all other FAA-regulated airlines require that carry-on be stowed during take-off and landing. In addition to overhead storage bins, most aircrafts have generous amounts of space under the seats where items may be stowed. American Airlines under-seat storage areas measure approximately 9 X 13 X 23 inches, accommodating portables easily.

Delta Air Lines stations vice president C.A. Thompson says that "tests performed by our avionics engineers produced no evidence of harmful effects from the use of portable computers aboard our aircraft." Therefore, he said, "Delta does permit the use of battery-powered portable computers aboard its

(continued on page 44)

PORTABLE

Disk Drive

for the Model 100/200**\$599****Includes a library of
six powerful programs**

It's the Holmes Engineering/PCSG "chipmunk"

Uses the main menu concept. You see the disk directory instantly, arranged on your M-100 screen like your main menu. Just move the wide-bar cursor and transfer files with a function key. You can run a file directly from the diskette with the ENTER key. Uses 3½" microfloppy diskettes that have a rigid plastic casing and a metal core. They're tough and nonflexible. You can carry several in a shirt pocket without damage. There's 358K on a diskette. Ten of these in your briefcase and you've got 3½ megabytes.

Drive weighs only three lbs. and it works directly from the 110 outlet and recharges at the same time. It recharges in six hours with thousands of pages transferred between charges. It's compact, with dimensions of 2¼" x 5½" x 7.5"; and fits easily into your briefcase along with your Model 100 or 200.

Machine code programs, BASIC programs, *Lucid* files and documents all are saved and retrieved with no protocol – instantly, ready to run.

Portability in a disk drive is an engineering feat. It's worth the investment to have the power and freedom that this Portable Disk Drive can bring you.

In a special association, Holmes Engineering and PCSG have worked together combining the hardware knowledge of Holmes and the soft-

ware expertise of PCSG. The result is a product that can only be regarded as excellent.

But what makes the drive so very special is that not only does it allow you to store and access files from RAM, but it has a wonderful feature like you would find only on a desktop computer.

You see the disk directory instantly; works just like the main menu

Here is what is really exciting. The portable disk drive has Random Access. Included as part of the operating system in the drive (ROM) is a very powerful disk BASIC. This BASIC interfaces with the BASIC in your Model 100 in such a way that when the drive is connected they act as one.

This means that you can have BASIC programs that will access the diskette and read and write records directly on the diskette. Your RAM is used for programs while they are running and the data is then stored on the diskette, and only brought up into RAM for viewing or editing.

This means that your Model 100 combined with the portable disk drive is a very powerful data processing system. We have included with the drive six very excellent programs that make that statement a reality.

Just imagine yourself with this kind of capability.

Database – The portable disk drive stores your mailing list including names, addresses, phone numbers and information relevant to those names. You can have over 1500 names and addresses on a single diskette. You can also store inventory items, part #s and descriptions or any other data that you need to recall. You can design your own input screen to fit your needs. You can search for any word and the record or records appears on the Model 100 screen for viewing or editing. You can print out mailing labels or print out in a columnar fashion if you wish. You can merge names and addresses into form letters and print out promotional mailings to all or selected parts of your list.

Invoice (purchase order) – The portable disk drive prints out perfectly prepared invoices or purchase orders. This is an excellent program made possible by the features of the portable drive's operating system. You can have all your customers' names and addresses filed on the diskette or on another diskette. You can have your inventory of items you sell filed on the same or a separate diskette. All you have to do to print an invoice is type in the customer number. Automatically, that name and address is found from the diskette and inserted in the invoice, or

PCSG offers a 30-day/money-back trial!

you can type in any name you don't have in your records. To bill out items you just type in a stock number and the quantity being shipped.

You designate whether an item is taxable or non-taxable. Automatically the item name, description and price per unit are retrieved from the diskette and inserted on the invoice and the extensions are calculated.

358K on a diskette

You can keep entering more item #s and quantities, and you can type in any items or prices that are not on the diskette or need changing. When you have entered the last item, the totals are automatically figured including tax where applicable.

The completed invoice is then stored on the diskette. When you have completed all your invoicing, at the touch of a button you can print out your sequentially numbered, professionally done invoices on easily obtained standard forms. This is truly professional invoicing capability.

Purchase orders are just as easy. Supplier #s retrieve the name and address. Inventory #s automatically bring up the item and the cost. You type in the quantity ordered. You have all the features described in invoice preparation including storing your P.O.s on diskette and printing out beautifully formatted purchase orders with your company name, address and phone number as the letterhead.

Sort – This excellent utility allows you rapid sorting of any records you have compiled using the disk drive database program. You can sort on any file, for example, by last name, or city or zip code. Also, you can sort lists alphabetically or numerically. You can write the newly sorted list back in the same file on the diskette or to a new file.

Telcom interface – If you are a user that likes to access other computers or databases (for example CompuServe) by telephone then this powerful facility alone is worth the price of the disk drive. You can automatically download information from the distant computer onto the diskette. Large files of information are accessed by the program in a way that enables you to bring segments up into RAM for viewing later.

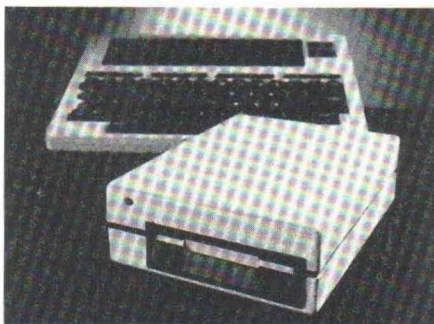
You can also automatically upload to your distant computer files that you have stored on your diskette.

Records or orders compiled on your Model 100 and stored on diskette can be sent over the phone at the touch of a function key.

Calendar – Everyone who has seen this program has said, "This is the first calendar/diary/scheduler on any computer anywhere that I can use. It is so functional."

The calendar program is usable for two reasons, first it is designed correctly, and second you have the memory (358K) on the diskette to log and access a tremendous amount of notes over a long period of time.

It works like this. On your Model 100 screen appears a month's calendar, for example June 1985, complete with all the dates arranged like a wall calendar. You can advance month by month with a function key or change to any month forward or backward any number of years with function key ease.



On any month, on the screen you move the cursor with the arrow keys (like the Main Menu) to the day you want to view or log and press ENTER.

From the diskette immediately is loaded that day's diary. You can review or type in just like text and when your entry is complete, a function key stores your entry on diskette.

By the way, you don't have to know the date of an entry to review it. You have F1 (find) search capability for any word or phrase.

Calendar prints out a nice 8½ x 11" sheet of the daily entries arranged in boxes over a two-week period. You can print these out over any time period you designate. These are great to carry with you or give to your secretary or co-workers for your schedule.

This is a calendar you can use. It is not only a planner and scheduler, but a diary as well. The 358K on a diskette means you can truly keep your activities in a way that you can access and utilize. For most people

one diskette will easily handle several years of appointments and notations.

Personal Finance Manager – You'll say, "Why hasn't someone done this before?" This wonderful program truly lets you keep track of your finances, and is excellent for your business as well as for personal use.

All your records are kept on the diskette. You can manage as many accounts as you want. Bank accounts (checking and savings) and charge accounts such as MasterCard and Visa.

Study your balance or review any previous transactions on the screen whenever you like. Prints out complete statements showing all account activity and balance.

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We at PCSG believe we have the ultimate Model 100 system. When you combine the Model 100 with the Portable Disk Drive along with its bundled software plus the *Lucid* spreadsheet on snap-in ROM, *Write ROM* word processing and the new 64K RAM expansion now available from PCSG, you have a computer with real functionality that you can use every day.

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MISMATCHING FOULS UP PARALLEL LINES

How do you interface a Model 100 to a Smith Corona TP II Plus? I have tried the parallel printer cable supplied by Radio Shack and one supplied by the Smith Corona dealer. The 100 will operate a Radio Shack printer and a TRS-80 Model 4 will operate the TP II Plus. But when I issue print commands from the Model 100 to the TP II Plus, nothing happens.

James W. Spears
Little Rock, AR

►I need more information. Do you mean the TP II Plus doesn't respond to LPRINT and LLIST? And does your computer lock up and freeze at the line with the LPRINT command? Does issuing LLIST make the cursor disappear, never to return until BREAK? Or does the program run as if the LPRINT had been executed by the TP II Plus? I suspect the problem is in the printer cables.

Get the technical manual for the TP II Plus and compare its parallel printer port lines with the parallel printer port lines listed in the 100 reference manual. You'll find that while the actual pin-numbers used don't match, the line descriptions do. Both ports have a line marked data bit 0, signal, ground and so forth.

What is probably happening is that the 100 cable is not connecting one of the lines properly to the TP II Plus. If that's the case, fix the cable to properly interconnect all the appropriate lines. You may need a technician to check this out for you.

A less likely possibility is that one of the printer status lines on the Model 100 is electronically too weak to operate properly. The 100 had this problem with its RS-232 port. Three resistors on the port had values too high and made the Model 100 fail to work with the TRS-80 Model II computer. The values were chosen to protect the sensitive CMOS chips in the Model 100, but they did the job too well and interfered with normal operation.

Talk directly with the Tandy Model 100 support division and with Smith-Corona headquarters. They may have already solved the problem.

Let the Slack Out on String Space

When I try to run Alidad Farmanfarma's Texthelper 2.0 program (Portable 100, Dec. 1983, pg. 9), I get a ?OS ERROR IN 140 indication after the salutation in my test letter. Then the process stops.

I tried debugging the program, but to no avail. The program looked so simple and efficient.

John J. Wetzel
Grosse Pointe Farms, MI

►Increase the amount of string space cleared at the beginning of the program. The first line of the program should have a CLEAR x statement (where x is a number). You'll have to experiment to find the exact value of x.

In most cases a value of 533 will do the job. If you still get an OS Error, increase the amount in the CLEAR statement by a hundred and try again.

The CLEAR statement sets aside the specified amount of random-access memory (RAM) for use as a string buffer. If you use a lot of string variables it's possible to run out of room. Because the text-formatting program is reading another text file, at least one variable will have 256 characters in it at one time.

To process this long variable, most of the string is assigned to another variable. The worst possible situation occurs when the entire string is assigned to the second variable. If both variables are at their maximum length, you need 512 bytes of CLEARed RAM plus a few for miscellaneous use. If the salutation is assigned to a third variable, then you need to reserve additional bytes equal to its length.

To compute the amount to CLEAR, take the number of variables you expect to approach 256 bytes, multiply them by 256 and add 100.

After running the program several times you can determine if you chose the

right amount. It would seem that Alidad wasn't thorough in selecting the amount to CLEAR.

Proper Protocol to Lisa Connect

Have you had any luck interfacing the Model 100 and the Apple Lisa? I have tried unsuccessfully to upload a Model 100 text file to it.

After I transmit, the Lisa screen prints garbage characters. Then, when it is done trying to transmit the file and the line is still open, I can directly type in any alphabetic character and the Lisa screen correctly displays the character typed (in lower-case only, even when I type capital letters). It would appear that the communications parameters are fine since it's picking up these characters.

Greg Harris
Maquoketa, IA

►No, the parameters aren't fine. If you type capitals you should get capitals. The fact you're getting characters transmitted and received is an indication the cable between the two is working properly. Similarly, this also indicates that the baud rate is correct.

The correct reception of lower-case letters, but not capitals, indicates that word length, stop bits and parity checking are out of synchronization. Another possibility is that the software is filtering out capital letters and converting them to lower-case. Set the Lisa software to 300 baud, seven-bit words, one stop bit and no parity checking.

XON/XOFF protocol can be enabled, but isn't required. Set the 100 to 37N1E or 37N1D. Double-check your Lisa software to make sure it isn't intercepting some of the characters and converting them. If both computers have the same parameters, you should get perfect transmission and reception when typing.

Uploading and downloading can be more difficult. If you still have garbage

(continued on page 54)

SUPERA

The Model 300 Is Here... You Already Own It!

In January 1983, Micro Demon introduced the Model 100 enhancement PRO AID. Suddenly Model 100 users found that their computer had capabilities far beyond their expectations.

In his InfoWorld review of PRO AID, Reviewer Greg Springer, anticipating the announcement of the Model 200, wrote,

"PRO AID adds enough new capabilities to the current model that the wait for upgraded portability is made much easier and maybe even unnecessary."

Well, the Model 200 is here. But so is SUPERA! SUPERA takes a giant step past PRO AID, and adds a multitude of powerful new features to the Model 100, making it into the computer it was meant to be.

Once it is loaded, SUPERA interfaces itself with the operating system in your Model 100, and works transparently to you and your programs. If it weren't for all the wonderful things it does, you would never even know it was there.

If you want to remove it, SUPERA is as easy to take out as KILLing a BASIC program.

Unique Format

SUPERA loads and runs as if it were a BASIC program (it's really all machine language). Because of this unique format, SUPERA is compatible with most other software and hardware. No need to worry about relocating it or other memory conflicts. It also only requires 4.3K of memory.

With SUPERA installed, every facet of your computer suddenly takes on an aura of new-found power. Your computer behaves just like before except that now you have many additional capabilities.

In Text

While in TEXT you can

- Use a really fast and flexible search and replace function
 - Turn on a special type over mode in which typed characters replace text instead of being inserted
 - Read a second file while editing a first
 - Use control keys, to delete words and lines, to change the case of the characters under the cursor, and to activate the paste key
 - Cause the display to scroll slowly up or down a line at a time
 - Redefine special keys to act as SHIFted keys, control keys, or graphics characters
 - Turn the computer off without losing your place
 - Access special HELP files
 - Use 26 new macro function keys
- and more!

All of Supera's editing features become available whenever you enter EDIT mode to edit a BASIC program

Super Function Keys

A great deal of SUPERA's power comes from its 26 macro function keys. These easy to define keys can be used in TEXT, TELCOM and BASIC. Each key generally defines a string of 14 characters, but in both BASIC and TEXT several keys can be

concatenated into one so as to provide longer keys (up to over 300 characters maximum)

The power of these function keys is hard to imagine until you try them.

In TEXT they can provide you with much more than just easy entry of boiler-plate strings. They can also be defined to automatically carry out complicated editing sequences.

In TELCOM, these keys can save you money while accessing a data base such as Compuserve. They also save you the trouble of remembering such things as passwords, ID numbers, and special commands.

In BASIC, use the keys to enter BASIC commands, and to facilitate typing in programs, to name just a few applications.

Moreover, Supera allows you to save and load entire sets of function keys by a single control key action. Thus you might keep a set of keys called TEXKEY.CO handy to use in TEXT, another keyset for BASIC, another for TELCOM, and yet another for use in Worksheet mode. The original keyset uses no extra memory, and each extra one only takes up 400 bytes.

In BASIC

You get the 26 function keys, and also

- Single stroke access to the built-in software such as TEXT and TELCOM
- Automatic Line Numbers
- Control key activation of selected BASIC commands
- You can redefine special keys

Worksheet Mode

From BASIC you can enter an entirely new mode called Worksheet mode. While in this mode you can quickly and easily evaluate expressions. By assigning expressions to function keys, you can change the value of a single variable, and then instantly check the new value of the expression. Worksheet mode also provides several new BASIC functions.

Better Than PRO AID

It's true that PRO AID was a significant enhancement to the Model 100, but SUPERA goes far beyond it. In a message on the Compuserve Model 100 SIG, system operator Dave Thomas said,

"Now with SUPERA, the original PRO AID has been enhanced beyond belief... If there is a single, more useful utility on the market for the Model 100 than SUPERA, I haven't heard of it and t'would boggle my mind if t'was!!"

TEX PRO

For Those Who Process Words

TEX PRO consists of ALL the TEXT editing features of SUPERA, uses only 2.8K of memory, and sells for just \$49.95. It may be the choice of those who seldom use their Model 100 except for word processing, and don't need all the additional power of SUPERA.

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Or call our 24 hour order line, 803-733-0980.

RS26

HAVE SUNDAY BRUNCH ON THE SIG

Have you been looking for a place to find other Model 100 users, to share problems and ask their advice? Look no more. One popular meeting ground is the weekly Sunday conference on the Model 100 SIG on CompuServe. From 11:00 a.m. to 1:00 p.m. sysop Dave Thomas guides discussion by Model 100 owners, and they're well worth attending.

This regularly-scheduled conference is the SIG's electronic equivalent of the smoke-filled room — real-time bull sessions. Anything you type on your 100's keyboard while in the conference mode appears simultaneously on the screens of all other conference attendees. Comments instantly come back to you.

LIKE YOU AND ME

Unlike electronic mail, SIG conferences are immensely satisfying. It's nice to know there are people like you out there, interested in sharing experiences and finding out concerns and questions.

Keep in mind this analogy while learning conferencing: CompuServe's SIG conferences are set up like citizen's band radio, with each SIG having its own channel. Note, however, that conferences are *not* the same as CompuServe's CB simulation.

Usually when you access CompuServe and issue the GO PCS-154 command at the ! prompt, one of the messages you'll see is:

0 members in conference

If there are people listed, join the conference. Don't worry about disturbing anyone — conferences are public and you are welcome to join in — especially on Sundays.

SOME HELP FROM DAVE

Before you try conferencing read Dave Thomas' CONFER.HLP file, stored in the DL8 data library.

From the function prompt issue the SIG command CO. You'll see some variation of what's displayed in table one.

At this point anything you type in will be sent to all other viewers on Channel 30. Special commands must be typed beginning with a slash (/). Typing Ctrl-C will take you out of the conference and back to the regular function prompt.

While in conference mode you can type out the command /help to get some quick on-line assistance. See table two for the current /help printout. It might be helpful to keep that table handy when you're in a conference.

The following are tips from Dave Thomas' CONFER.HLP file, general courteous practices:

1. Don't sneak in and lurk. Announce yourself with a quick "Hi". During regular conferences do not answer such arrivals and thereby be rude to the guest. Let the moderator take it.

2. Type "..." at the end of each line to show you are still talking. Only 80 characters per line, remember.

3. Type "ga", for go ahead when you are done.

4. Take your turn. If it's a conference rather than chit chat, the moderator will tell you when you are next.

Here are some control codes you'll need while in conference mode:

Ctrl-V will display the line you have typed but not yet transmitted with Enter.

Ctrl-U deletes a typed line prior to transmission.

Ctrl-C exits CO area, as does the /EX command. □

table one

Function: CO

Conference bulletin:

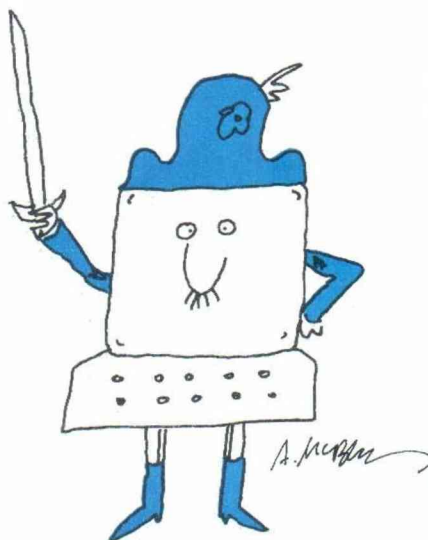
Sunday Chit-chat 11:00-13:00 EST
Have you read CONFER.HLP in XA8?
Please shorten your handle to just first name and last initial.
Type /HELP for CO command list.
Use CTRL-C to escape to the SIG.
Entering CO area...

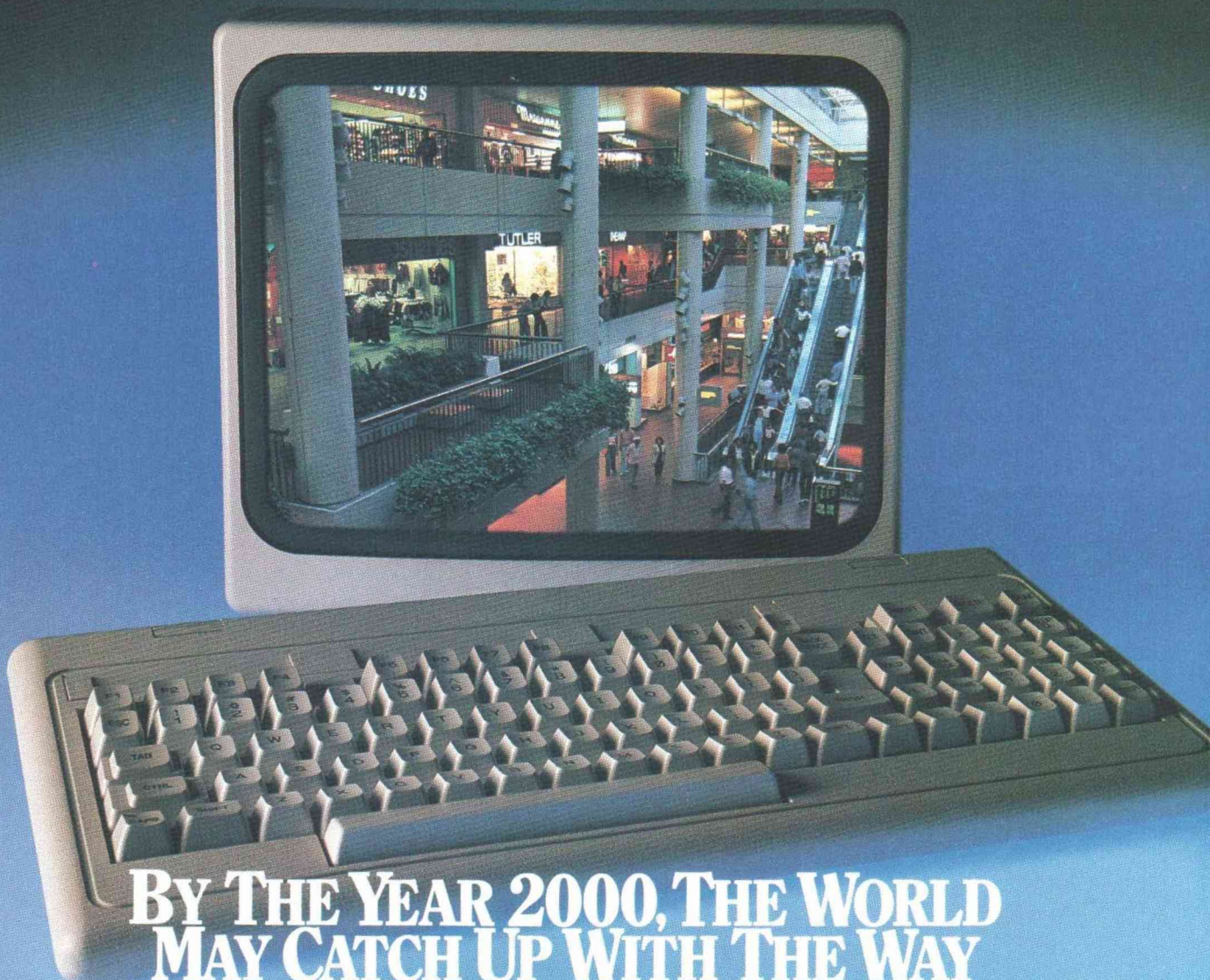
Welcome to channel 30!
(Channel) users tuned in
(30)1

table two

Prefix Commands with a Slash

/TUNE # Tunes channel # (1-36)
/TALK # Private talk with job #
/MON 1,4 Monitor extra chnls
/UNM 7,3 Unmonitor channels
/STATUS Type channel status
/DAY Type time, day and date
/USERS List on-line users
/USERS # Users on channel #
/EXIT Exit CB
/OFF Exit CB and log off
/WHO Last talker's User ID
/HANDLE Change handle
/SCR xyz Scramble on key "xyz"
/SMC xyz Scr & Monitor Clear
/XCL xyz Xmt CLeAr; unscr recv
/UNS Unscramble (both clr)
/SQU abc Squelch handle "abc"
/SBU#, #Squelch by User ID
/JOB Type your job #
/UID User IDs w/ messages
/NOUID Turn off
/UID
/BAND x Switch to Band "x"
/GO mm-n Go to Page "mm-n"





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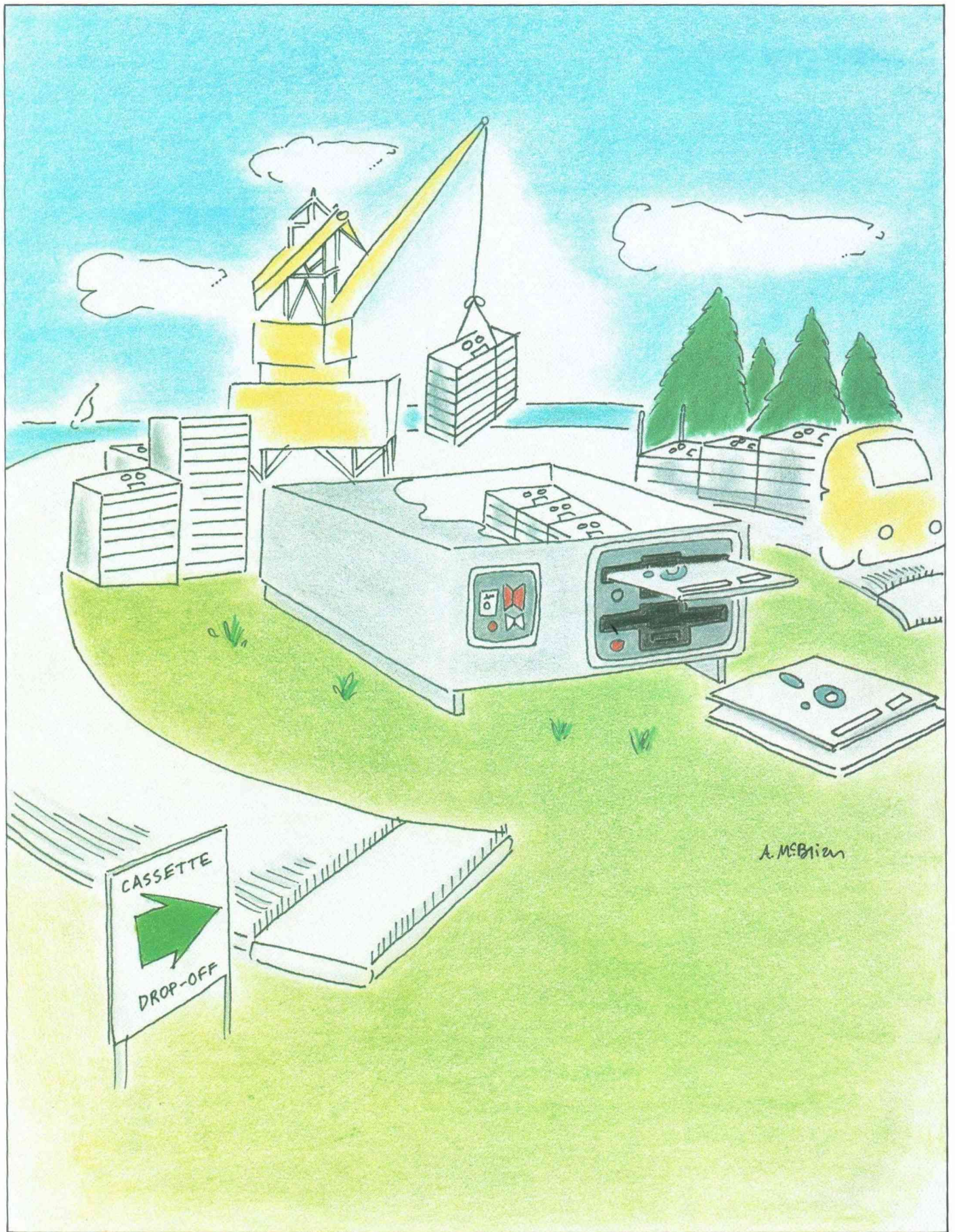
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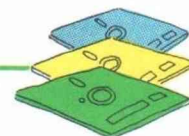
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CHIPMUNK VS. PIC DISC: MAKING THE CHOICE

The lack of a truly portable disk drive has kept Model 100 users chained to the desk-top. Now two firms proffer solutions.

BY JOHN P. MELLO JR.

The clamor for a portable disk drive has echoed in Tandyland since the Model 100's April 1983 introduction.

Two years later, after much weeping and gnashing of teeth, not one but two portable drives are available — the Chipmunk with hardware by Holmes Engineering of Salt Lake City, Utah and software by Portable Computer Support Group (PCSG) of Dallas, Texas and the PIC Disc from Personal Integrated Computers (PIC) of Irvine, California.

Both products, unlike Tandy's Disk/Video Interface (DVI), are portable disk drives, pure and simple. Neither adds video interfacing or other advanced

functions to its repertoire as the DVI does.

The 2.5-pound, 7.4 by 5.5 by 2-inch Chipmunk is slightly smaller than the PIC Disc — about the size of a thick paperback book. The PIC Disc also weighs 2.5 pounds, but is slightly larger: 8.38 by 4.75 by 2.88 inches. Each of the drives is considerably more wieldy than the breadbox-sized DVI.

INTERFACE WARS

The DVI's 40-pin connector has been a popular target for the critics ever since the drive was introduced. Its delicate structure wasn't made for the wear and

tear of frequent connection and disconnection. Tandy has tacitly acknowledged this flaw by building a more-rugged connector into the 100's spawn, the Tandy 200.

PCSG and PIC have devised nice solutions to Tandy's connector problem.

The Chipmunk's solution comprises two pieces of hardware: a 22 by 1.3-inch ribbon connector and a U-shaped host adapter that plugs into the 100's expansion bus. The adapter's round pins are stronger than the flimsy flat ones on the DVI's connector.

The adapter, which inserts easily into the expansion socket, leaves the 100's

Disk Drive Comparisons

	Chipmunk	PIC Disc	DVI
Size (inches)	7.38 x 5.5 x 2	8.38 x 4.75 x 2.88	12.5 x 11.75 x 5.25
Weight	2.5 lbs.	2.5 lbs.	17 lbs.
Disk Size	3.5 in.	3.5 in.	5.25 in.
Disk Capacity	360K	360K	184K
Battery Life	1.5 hours	2.5 hours	n/a
Software	CDOS	CP/M, T/Maker, Modem	none
Price	\$599	\$799	\$799

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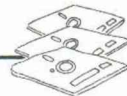
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TM

RS58



read-only memory (ROM) socket accessible for insertion of Tandy's Multiplan or PCSG's Lucid. The adapter provides a male plug. The cable is female at both ends so it can withstand the wear and tear of frequent connection and disconnection.

The Chipmunk connection has two problems — one unavoidable, the other easily remedied.

The ribbon cable that connects the Chipmunk to the 100 is too short. According to the manufacturer, longer cables fail to pass Federal Communications Commission regulations on radio frequency interference.

The U-shaped door that replaces the compartment cover doesn't fit properly. But this is a minor problem. The door can be shaped to fit the compartment by paring some of the plastic from it with a sharp knife.

GET YOUR TOOLBOX

Installing the PIC Disc is more complicated than setting up the Chipmunk, but not unduly difficult. You need tools — Phillips and flat-head screwdrivers — and there are more pieces to install. The entire operation takes less than 20 minutes.

To install the PIC Disc, turn the 100 bottom-up and open up the expansion bus compartment. Two short Phillips screws on the right side of the 100 are removed. A metal plate with a short ribbon cable is placed on the bottom of the computer. It's secured in place with two long screws that fit into holes previously occupied by the short screws.

The male end of the ribbon cable, exactly like the DVI's, plugs into the 40-pin bus socket. The cable lies flat against the bottom of the computer. Two velcro strips — positioned properly with the aid of a PIC-supplied template — hold a plastic case over the 100's bottom.

With the plastic case in place, a metal lip extends from the side of the computer. On the bottom of the plate is a 40-pin female connector. The PIC Disc slides over the plate and is locked into place, docking with the 100 to form a single portable unit.

The velcro lets the user remove the false bottom easily to install new batteries or a ROM chip. The arrangement seems secure. It's difficult to trust velcro as a long-standing solution, but the alternative — securing the base bottom with screws — would have been more trouble than it was worth.

While the PIC Disc uses the same maligned connector as the DVI, it poses less of a problem. Theoretically, there's no reason to disconnect the plug once it's connected. If you want to use the 100



The PIC Disc attaches to the bottom of the 100 with screws and velcro strips, forming a single conveniently portable package.

without the disk, leave the hardware behind and tote your 100 around with the false bottom on it. With the DVI you always have to pull out the connector if you want portability.

BATTERY LIFE

Both portable disks come with rechargeable batteries. When fully charged, the Chipmunk's battery provides 90 minutes of constant use. According to PCSG, that's six to 10 hours of practical use.

This is likely as drive use is usually intermittent. You load a file, work on it, then save it. The drive consumes power only during the load and save operations when the disk is rotating.

A low-battery indicator on the front of the drive lights up when the battery charge is close to depletion. When the light comes on, the user has two to three minutes of drive time left — enough time to load or save a couple of files.

Once the batteries are dead the drive is unusable, even with the supplied AC adapter. The user must charge the batteries for 10 or 15 minutes before operating the Chipmunk under AC power. Continued AC use replenishes the charge. But the most efficient way to recharge the battery is to leave the drive plugged into the adapter with the power switch off.

The 100's adapter runs the drive, but won't charge the batteries fully. Never use the drive's adapter to run the computer. The Chipmunk's adapter produces too much voltage for the 100.

The PIC Disc runs 2.5 hours on a fully charged battery. When the drive's battery is completely discharged it takes

four hours to bring it to 80 percent charged and 11 hours to charge it 100 percent. If the battery is 50 percent discharged, it can be brought up to 80 percent charged in two hours and 100 percent charged in seven hours.

When the low-battery light comes on, the user has five minutes to finish working and start recharging the battery. Like the Chipmunk, the PIC Disc charges its internal batteries during AC operation.

SOFTWARE PHILOSOPHY

The technological and procedural differences that distinguish the Chipmunk from the PIC Disc are minor compared to the divergent philosophies exemplified by their bundled software.

Holmes and PCSG have made the Chipmunk's operating system fit into the Model 100's natural environment. The premise is that the 100's built-in software does its job and needs only minimal enhancement.

The PIC Disc seems to be based on the premise that what everyone really wants in the 100 is a desk-top operating system. The unit's bundled software treats the 100's firmware like a poor relation.

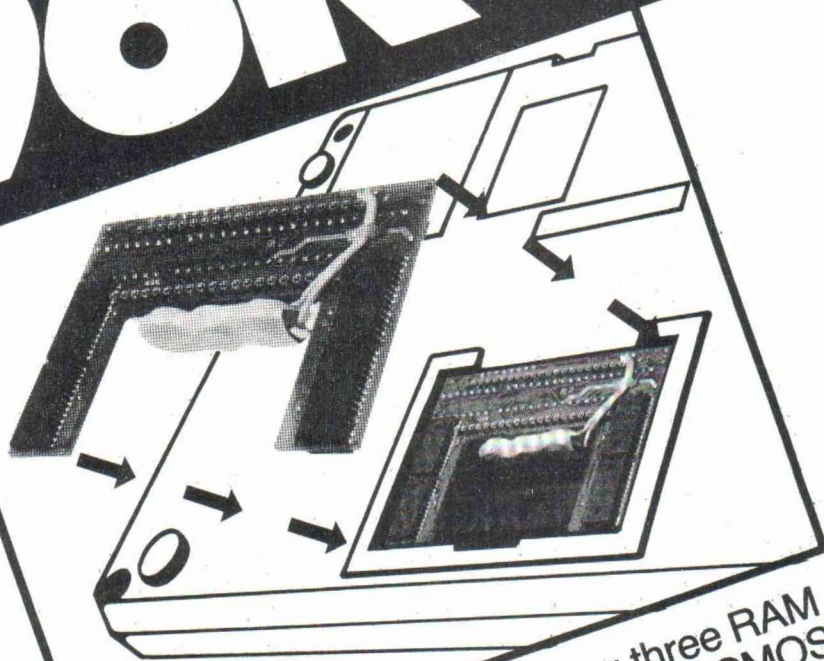
BUILT-IN SPEED

The Chipmunk's operating system, CDOS 3.0, reflects PCSG's philosophy. Like TEXT and TELCOM, CDOS is built into a ROM chip. As a result it loads very quickly: 1.97 seconds without a disk in the drive or 2.66 seconds if it must read a disk directory.

CDOS loads automatically whenever the user presses the 100's Reset key. It

(continued on page 50)

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A Super Organizer for Large-Scale Lists

*When you depend on contacting a lot of people by mail,
Magnalist becomes a versatile information manager.*

By Richard Ramella

Whether for a promotion campaign, a mail order business or subscriptions, the key to the usefulness of your mailing list is organization. Addressograph plates and index cards are the traditional tools — and they're fine for small lists. But if you need to organize a long one, you better get an address-management program.

Armed with your 100, a disk-video interface and this BASIC program, storing a 2,500 address list becomes a cinch.

Magnalist keeps track of six times the amount of material that can be stored in a 32K Model 100. It counts the number of items in files, prints mailing labels, sorts alphabetically by last name and allows the user to add and delete items.

FILEMAKER ON THE RUN

Once you've typed and saved listing one (Filemaker) and listing two (Magnalist), load filemaker into the computer. Put a blank, formatted disk in the drive. The disk should be formatted for drive 0.

When Filemaker is run, it creates 49 files — two or three for each letter of the alphabet. For a guide, see the value of B

listing one Magnalist Filemaker

```
100 REM * Magnalist Filemaker * TRS-80 Model 100 / Ramella
105 REM * Creates files Aa to Zz
110 REM * Requires Disk/Video Interface
120 CLS: MAXFILES=1: DEFSTR A
130 PRINT "WORKING . . . PATIENCE PLEASE."
140 A="AaAhAgBaBhBgCaChCqDaDhDqEaEhEqFaFhFqGaGhGqHaHhHqKaLaLhLqMa
MhMqNaNhNgOaPaPhPqRaRhRqSaShSqTaThTqUaWaZz"
150 FOR X=1 TO 97 STEP 2: Q$=MID$(A,X,2): PRINT"Creating File "Q$

160 OPEN "0:"+Q$ FOR OUTPUT AS 1: PRINT #1,"0": CLOSE: NEXT
170 PRINT "Disk now contains 50 files ranging from Aa to Zz."
180 PRINT "Work completed. Go to main program.": END
```

in line 130 of listing two. The creation of each file is announced on the screen.

Don't run Filemaker again once you've created files on a disk. If you do, it will erase all data in the files and create new empty files. That's why it's a separate program. Before continuing, kill Filemaker. You still have it copied on disk.

Now load Magnalist and create a text file called NAMES. Each address is to be typed, without using commas, like this:

Lastname*firstname*address*city state zip

If you find your 100's memory has dropped below 9,500 bytes, stop where you are and go to the next step. You can always return for more entries. To see how much memory is free, press F8. The free bytes figure is printed at the bottom right corner of the menu.

Magnalist displays this menu:

1. New items from NAMES.DO to disk

MAGNALIST

2. Sort items in disk files
3. Print full list on paper
4. Count items in all files
5. Delete item from file Press the 1 key and Enter. The next part is automatic.

The program looks at the first two letters of the addressee's last name in the text file NAMES and assigns the entire address to the appropriate disk file. For example, Biltmore falls alphabetically between Bh and Bq so it would go in the Bh file. You're told when the work is complete. The program ends, and the text file NAMES is killed.

At this point you can create another NAMES file and repeat the file assignment process. This postpones a potentially lengthy sort.

MAGNA MENU

For menu items three, four and five to work, first you must sort the list. Run Magnalist and choose menu option two. The alphabetizing process can take some time, especially if you have hundreds of names in files. But since it's automatic, you can leave the computer and do something else. If you decide to watch, you'll see messages telling which file is currently being sorted. The end of the sort is an

listing two
Magnalist

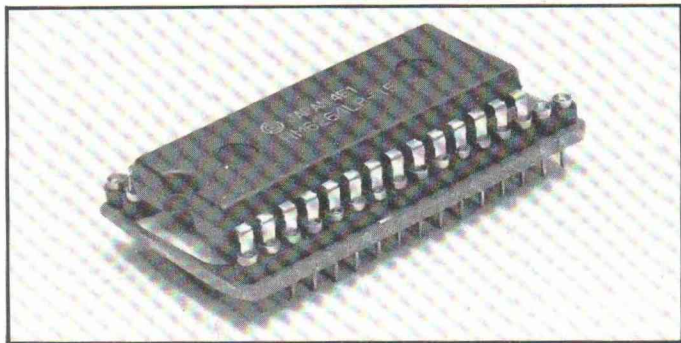
```

100 REM * Magnalist *
110 REM * TRS-80 MODEL 100 DISK VIDEO INTERFACE / RICHARD RAMELLA
120 CLS: CLEAR 8500: MAXFILES=2: DEFSTR A-H
130 DIM A(150),G(5):
B="AaAhAqBaBhBqCaChCqDaDhDqEaEhEqFaFhFqGaGhGqHaHhHqKaLaLhLqMaMhMq
NaNhNgOaPaPhPqRaRhRqSaShSqTaThTqUaUaZz"
140 PRINT CHR$(27);"p";"Menu for Magnalist"CHR$(27);"q"
150 PRINT "1 - New items from NAMES.DO to disk."
160 PRINT "2 - Sort items in disk files."
170 PRINT "3 - Print full list on paper."
180 PRINT "4 - Count items in all files."
190 PRINT "5 - Delete item from file."
200 PRINT: INPUT "Your choice by number";V
210 V=INT(V): IF V<1 OR V>5 THEN CLS: GOTO 140
220 ON V GOTO 230,320,610,820,920
230 REM * Items from NAMES.DO to disk
240 OPEN "NAMES.DO" FOR INPUT AS 1
250 INPUT #1,C: Q3$=LEFT$(C,2)
260 FOR V=1 TO 97 STEP 2: Q1$=MID$(B,V,2): Q2$=MID$(B,V+2,2)
270 IF Q3$=Q1$ AND Q3$=Q2$ THEN OPEN "0:"+Q1$ FOR APPEND AS 2:
PRINT #2,C: CLOSE 2: GOTO 280 ELSE NEXT V
280 IF EOF(1) THEN 290 ELSE 250
290 PRINT "New names appended to file."
300 PRINT "NAMES.DO has been erased."
310 KILL "NAMES.DO": END
320 REM * Sort routine
330 PRINT "Sorting all files."

```

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RS13


```

340 PRINT " Required time increases with number of items in the
files."
350 FOR X=1 TO 97 STEP 2
360 D=MID$(B,X,2)
370 PRINT "Working on file: "D
380 OPEN "0:"&D FOR INPUT AS 1
390 Y=1
400 INPUT#1,A(Y)
410 IF EOF(1) THEN 420 ELSE Y=Y+1: GOTO 400
420 CLOSE 1: M=Y-1
430 M=INT(M/2): IF M=0 THEN 560
440 K=Y-M: J=1
450 I=J
460 L=I+M
470 IF A(I)<=A(L) THEN 530
480 T$=A(I)
490 A(I)=A(L)
500 A(L)=T$
510 I=I-M
520 IF I>=1 THEN 460
530 J=J+1
540 IF J>K THEN 430
550 GOTO 450
560 OPEN "0:"&D FOR OUTPUT AS 1
570 A(1)=STR$(Y-1)
580 FOR J=1 TO Y: PRINT #1,A(J):NEXT J
590 CLOSE 1: NEXT X
600 PRINT: PRINT "Sort complete. Run ended.": END
610 REM * Print to paper
620 FOR X=1 TO 97 STEP 2
630 D=MID$(B,X,2)

```

nounced on the screen.

Menu option three alphabetically prints all items in all files. You will probably want to invest in a supply of gummed labels on fanfold sheets. Mag-nalist is set for these standard-sized labels. A tractor-feed attachment for your printer prevents paper drifts, which are inevitable during long printings.

The asterisks you put in the original entry come into play when printing. They demarcate four fields: first name, last name, address and city-state-zip. The program prints this information, then skips ahead to the appropriate place to print succeeding labels.

Menu option four counts the items in all files. It displays the results for each file and gives a total.

Menu option five lets you delete a single item. You are prompted to type the addressee's last name and to press Enter.

PRECISE SEARCH

The program searches the correct file for an entry beginning with the characters. If the entry doesn't exist, the program says so and ends. Otherwise, this prompt is given:

Smith

Delete this name: 1=yes 2=no

Unleash Your Model 100 With Software from Micro Demon

ASM - A Powerful 8085 Assembler

Only 3.6K bytes long, ASM is both compact and fast. In fact ASM can assemble a 15K source file version of itself in about 20 seconds. Input and output data can be either decimal or hex. Constants can be in either decimal, hex or binary. Output is automatically routed to the printer if the printer is connected and on.

ASM supports +, -, *, /, exponents, MOD, AND, OR, NOT, and the use of parenthesis in the data field.

While not a macro assembler, ASM contains a built-in library of useful macros which you can immediately add to your programs. Among these are a collection of relative branch instructions that make it possible to write relocateable routines for use with a BASIC program.

ASM checks for most common errors, and if one is detected, it displays the offending line with the error in inverse video.

As an end of assembly option, ASM will provide a table of addresses for all symbolic labels. This table includes the number of references to each label. ASM comes with full documentation, and a listing of useful ROM routines. \$69.95.

DASM - Far Beyond a Mere Disassembler

DASM is for the serious ROM investigator. DASM does much more than simply disassemble the machine code inside your Model 100. It provides function key controls to easily follow the logical flow of the code, to access the contents of specific locations, to check the keywords corresponding to BASIC tokens, and more. DASM allows for input/output to be in either hex or decimal. You can interrogate any range of memory, and then return to the disassembly.

DASM also contains a remarkable split-screen effect that makes it possible to view the previous 8 lines of the disassembly. \$29.95

TEL PRO - A Telcom Enhancement

TEL PRO adds a whole new dimension to the TELCOM program. If you enter TELCOM via TEL PRO, you will discover a variety of new capabilities open to you. Without losing your connection, you can edit text files, kill files, access the MENU, check the time, perform BASIC calculations, upload BASIC programs (without converting to ASCII), set alarms, access help screens, append data from the display to text files, delete unwanted carriage returns from downloaded programs, and more. \$49.95

PRO AID - Background Power

PRO AID is a machine language program that adds many new features to your Model 100. You get 26 new, easy to define, super function keys that can be used in TEXT and TELCOM as well as BASIC. You also get automatic line numbers, instantaneous deletion of any range of BASIC lines, a special calculator mode with new BASIC commands, immediate access to MENU programs, a program status key, and much more. PRO AID uses less than 1.8K of memory, and can be relocated anywhere there is room. \$39.95

Send mail orders and requests for information to Micro Demon, Inc., P.O. Box 50162, Columbia, SC 29250. Visa and Mastercard are welcome. Or call our 24 hour order line, 803-733-0980. Add shipping and handling charges of \$3.00. **RS28**

MAGNALIST

If you press 2 the program continues to search, stopping wherever Smith begins a file entry.

If you press 1 the address is deleted and the run ends. The search gains precision with the number of characters you enter. For example, if you respond HILL, the program will select all entries beginning with those characters. If you type Hill*Sam*123 Magnolia, the search is narrowed.

SAFETY NET

Memory and disk-storage capacity are important concerns. Magnalist clears 8,500 bytes — a conservative number — to ensure sorts are done without error. If NAMES.DO is too large there might not be enough memory left over to run Magnalist. For this reason, it's best to type a few names at a time, saving work and creating a new NAMES file with each session.

Keep addresses as short as possible by abbreviating street name designations, using two-letter state codes and omitting as much punctuation as possible, especially periods. Note: commas can't be used at all.

As many as 2,500 addresses will fit on

```

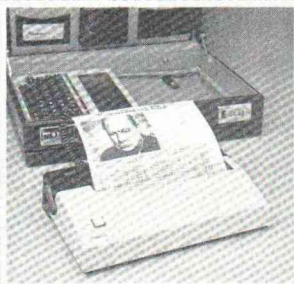
640 OPEN "0:" + D FOR INPUT AS 1
650 INPUT #1, H
660 IF EOF(1) THEN 800
670 INPUT #1, H
680 REM * H equals each incoming address
690 R=1
700 FOR T=1 TO LEN(H)
710 F=MID$(H, T, 1): IF F="*" THEN R=R+1: GOTO 730
720 G(R)=G(R)+F
730 NEXT T
740 REM * In lines 750-760, change LPRINT to PRINT for screen
    print

750 LPRINT G(2): "G(1): LPRINT G(3)
760 LPRINT G(4): FOR T=1 TO 3: LPRINT: NEXT T
770 FOR U=1 TO 4: G(U)="": NEXT
780 IF EOF(1) THEN 800
790 GOTO 670
800 CLOSE: NEXT X
810 PRINT "All names printed. End.": END
820 REM * Count all items in file
830 CLS: PRINT "Item Count": PRINT
840 FOR X=1 TO 97 STEP 2: D=MID$(B, X, 2)
850 OPEN "0:" + D FOR INPUT AS 1
860 INPUT #1, H
870 J=VAL(H): W=W+J: PRINT "File "D" - ";
880 PRINT USING "#####"; J;: PRINT SPACE$(4);
890 CLOSE: Q=Q+1: IF Q=2 THEN PRINT: Q=0
    
```

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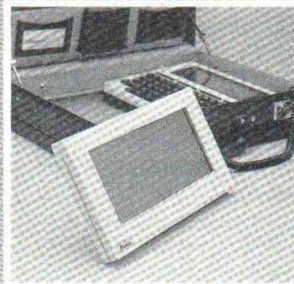
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```

900 CLOSE: NEXT X: PRINT: PRINT "Total entries:"W
910 PRINT: PRINT "Work done. Run ended.": END
920 REM * Delete an item
930 CLS: PRINT "Type last name of addressee to be"
940 PRINT "deleted and press enter."
950 PRINT: INPUT Q$
960 Q3$=LEFT$(Q$,2)
970 FOR V=1 TO 97 STEP 2: Q1$=MID$(B,V,2): Q2$=MID$(B,V+2,2)
980 IF Q3$=>Q1$ AND Q3$=<Q2$ THEN OPEN "0:"Q1$ FOR INPUT AS 1:
GOTO 990 ELSE NEXT V
990 INPUT #1,H: J=VAL(H): A(1)=H
1000 FOR T=2 TO J+1
1010 INPUT #1,A(T)
1020 NEXT T
1030 FOR T=2 TO J+1
1040 IF INSTR(A(T),Q$)=0 THEN 1100
1050 PRINT: PRINT
1060 PRINT A(T)
1070 INPUT "Delete this name: 1=yes 2=no":L
1080 IF L<>1 AND L<>2 THEN 1050
1090 IF L=1 THEN A(T)="": GOTO 1120
1100 NEXT T
1110 CLOSE 1: PRINT "Name not found. End of run.": END
1120 CLOSE 1: OPEN "0:"Q1$ FOR OUTPUT AS 1
1130 J=J-1: A(1)=STR$(J)
1140 FOR T=1 TO J+10: IF A(T)<>"" THEN PRINT#1,A(T)
1150 NEXT: CLOSE 1: PRINT Q$" eliminated. End of run."
1160 END

```

each disk, based on a 50-character average entry length. A more realistic expectation is for 50 addresses of 50 characters in each of 49 files.

The 8,500 bytes of cleared string space and dimensioning for up to 150 items per file are safeguards. Type LFILES from time to time to check the number of disk storage bytes remaining. Don't push it.

FOR YOUR EYES ONLY

The contents of disk files are easy to see. Just create a text file, press F2 and answer the prompt by typing 0. Follow this immediately by a file name and press enter. If you delete or add addresses, change the number at the beginning of the file. It counts the number of entries during a run of Magnalist.

To put the new information back into the file, press F3 and answer the prompt Save to: by typing 0: followed by the file name. If you're not making any changes, the text file in the computer may be killed without affecting the disk file.□

Please help us rate this article's overall value. If you found it very valuable, circle 125 on the reader service card. If it was moderately valuable, circle 126 — and if it wasn't valuable to you, circle 127.

Why Handle Files One at a Time? Let XOUT/XIN from BKI do the work for you.

Eliminate tedious (and fault prone) load/save/kill and format procedures on your MODEL 100. XOUT/XIN programs automatically create/read and display RAM and external directories. Resulting free space is displayed as files are selected/deselected to aid in memory management. Menus and prompts provide a safe, easy-to-use file management utility—an amazing productivity tool.

Use XOUT.BA to send multiple copies of selected memory files to the tape (**Save**); or send them directly (**List**), or via a formatter (**4mat**), to either the printer or the screen. Selected files can simply be removed with the **Kill** command and confirmation. An external directory is automatically created for each copy of a file set that is saved (containing creation date and time, and an ordered list of names and file sizes). Files saved on tape, including the directory, may also be loaded one-by-one by BASIC or TEXT, in the usual way.

Use XIN.BA to automatically **Load** selected tape files back into memory; or send them directly (**List**), or via a formatter (**4mat**), to the printer or the screen.

Typical XOUT.BA Menu

```

:XIN B 3379:SECT02D 742:
:XOUT B 4130:SECT03D 1725:
:DO4MATB 4738:SECT04D 620:
:BA4MATB 1908:PRTCAPD 206:
:basic B 2:paste D 1:
:SECT00D 4982:
:SECT01D 1434:
5653 Free 23867 Used 29520 Total
Save List 4mat Kill Abrt Menu

```

— XOUT.BA —

- Displays memory contents in memory address order.
- As files are highlighted memory statistics are changed to reflect values if **Kill** selected.
- BA files are stored on tape as standard tokenized files.
- Label line alternatives with statistics line by toggling the label key.
- Any combination of files can be highlighted by positioning the pointer and pressing space or enter. No action is taken until commanded by a function key, and then all highlighted files are affected.
- The **4mat** command invokes the BA4MAT.BA program to format BA files and the DO4MAT.BA program to format DO files.

Skeleton BA4MAT.BA and DO4MAT.BA programs are provided as examples for interfacing existing formatters. Full featured BA4MAT.BA and DO4MAT.BA programs, already interfaced with the XOUT/XIN programs, are offered as separately priced items. DO4MAT.BA and BA4MAT.BA format a single file if executed from the main menu or multiple files if executed via XOUT or XIN.

— DO4MAT.BA —

- Formats documents using embedded command descriptions for many features, including columns, underlining, **bold print**, filling and adjusting.
- Optional headers and footers may include the date, time and page number.
- Specify printer make and model. (Customizing directions given for printers not yet implemented.)

Typical XIN.BA Menu

```

:XIN B 0:SECT03D 1725:
:XOUT B 0:SECT04D 620:
:DO4MATB 0:PRTCAPD 206:
:BA4MATB 0:
:SECT00D 4982:
:SECT01D 1434:
:SECT02D 742:
16862 Free 12658 Used 29520 Total
Load List 4mat Abrt Menu

```

— XIN.BA —

- Displays tape contents in tape position order.
- As files are highlighted memory statistics are changed to reflect values if **Load** selected.
- If the file name exists in both the tape and memory directories, the difference (+, -) in size is shown.

— BA4MAT.BA —

- Formats BA files so that the individual basic commands are listed one per line indented from the basic line number.
- Additional indentation occurs to diagram the IF-THEN-ELSE structures in the program.
- Pagination including the date, time and page number are provided.

XOUT.BA/XIN.BA
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RS11

Anyone who experiences LUCID[®] won't settle for anything else.



is an advanced spreadsheet that is a program generator as well.

on Snap-In[™] ROM

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PCSG was the first to develop software for the Model 100. That was back in April of '83. We could have rushed out onto the market with an inferior spreadsheet, but we chose to undergo a significant development and produce a spreadsheet for the Model 100 that would truly be world class. A spreadsheet that would rival Lotus 1-2-3*.

LUCID[®] is here now. It is on a ROM cartridge that snaps into the compartment on the back of your Model 100. It takes no memory to load and no memory for operating overhead. That means you have the full 29.6k bytes free to store your data.

LUCID[®] is amazing in so many ways. First of all, it is memory conserving. It will let you build a large spreadsheet—255 row by 126 column capacity. Where other spreadsheets actually consume 4 to 5 bytes for an unused cell, LUCID[®] uses no memory for empty cells. This lets you build huge spreadsheets in

your Model 100's RAM that could consume 80 to 100K on a desktop computer.

Secondly, LUCID[®] is fast. Whenever you ask other spreadsheets to calculate a file of any size, you can get up and go get a cup of coffee before they are through. LUCID[®] is so rapid, a 36 column corporate financial statement took less than 4 seconds to calculate.

Thirdly, LUCID[®] has features you won't find in most other spreadsheets. For example, when you type a label (text) it will cross column boundaries, in other words when you type a label or title it will appear as you type it irrespective of column of width. LUCID[®] also allows you to set column widths individually, and of course LUCID[®] has insert row and insert columns, as well as other standard features. LUCID[®] even lets your formulas refer to cells in other spreadsheet files. Further, LUCID[®] has what no other spreadsheet has: Cut,

Copy, and Paste. It uses the same keys as Cut and Paste in TEXT, but here's the difference: it takes all the formulas with it when you paste and they all automatically recalculate with the entire sheet.

And here is what is really amazing. You can copy or cut from one spreadsheet and paste into another spreadsheet or even a TEXT file.

LUCID[®] supports all BASIC math functions as well as Log, sine, cosine, tangent, exponentiation and other sophisticated math functions.

LUCID[®] has so many features that you will say "this is what I need in a spreadsheet", such as automatic prompting of an incorrectly typed-in formula showing just where the mistake was made.

LUCID[®] has expanded "go to" functions that remember and produce a windowing capability. It has a special block definition capacity that makes many other

features possible that refer to whatever section of the spreadsheet you designate. LUCID® has many enhancements that make it easy to use. Once anyone begins to use it they say "this is the way a spreadsheet ought to work".

In the same fashion as TEXT creates ".DO" or document files, LUCID creates ".CA" or calculator files. In the same way you can get into any document file just by putting the wide bar cursor on the filename from the main menu, when you put the cursor on any ".CA" file, you are immediately working on that sheet.

But perhaps most remarkable is that LUCID® is not only a spreadsheet but a program generator as well. First, LUCID® lets you protect all cells against entry or change, and then unprotect just the cells you want for someone else to use as input fields.

Combined with the spill-over length feature, you can design input questions such as "What is your name?, What is your age?, Choose which applies to you: a) TALL b) MEDIUM c), SHORT, Type in the state where you were born". You can provide complete on screen instructions for use. This lets you create a series of prompts so that you can have a person totally unfamiliar with computers, entering information that you want to process, to create a personalized report based on calculations made using the facts and numbers they put in.

You see, LUCID® will not only process values, but text input as well so that the facts other than numbers can be responded to. LUCID® has the ability for you to refer in a formula to cells containing words. This feature combines with the capacity of doing "if then" statements that work by doing table look-ups against even massive X/Y charts of text or numerical information. A simple example based on the inputs

illustrated above would be to report the recommended calcium intake for tall people based on their age. You can make even more specific inquiries and reports, such as recommended amount of Aerobic exercise based on age and weight. Answers can be values or words depending on the situation, eq. 150 lbs., 25 years might be "30 minutes" but 280 lbs., 50 yrs might be "Warning: Aerobic exercise could be dangerous". You can produce a program that responds to inputs with no programming knowledge whatsoever.

You can prepare a report section in your spreadsheet with instructions to your user for printout, and they can produce a personalized printout that responds to their input. All your formulas and tables that did the calculations and provided the facts are invisible to that user. LUCID® is useful for doctors for patient questionnaires, trouble-shooting technicians, purchase clerks, people doing job quotes, stores for customer workups, insurance agents and anybody who needs to process specific facts and numbers to produce a report based on those responses.

LUCID® comes with a manual that explains not only the characteristics of LUCID®, but will train you how to use a spreadsheet even if you have never seen one before. You are shown how to do budgets, forecasts, breakeven analysis amortizations and many other types of personal and business reports and calculations.

User friendly is such an over-used term in this industry, but we can tell you that everyone who uses LUCID®, who has experienced any other spreadsheet, says that LUCID® is amazingly easy to use. A typical comment has been "I have never seen a spreadsheet that does so much, and yet LUCID® is so much easier and faster to use."

LUCID® is a result of a most exhaustive developmental effort in which PCSG's objective was to develop a spreadsheet that was better than the state-of-the-art. We are so pleased because LUCID® provides for the Model 100 spreadsheet capability you cannot equal on a desktop computer. Plans are underway to offer LUCID® someday for larger computers, but for now TRS 80 Model 100 owners have the good fortune of having this powerful exciting ROM program exclusively.

LUCID® is the easiest to use, fastest and yet most feature-rich spreadsheet, with capability that takes it far beyond the definition of a mere spreadsheet. We are so excited about LUCID®, because it changes the Model 100 into a totally different computer with power and function most never dreamed possible.

LUCID® is, in our opinion and that of those who have examined it, a breakthrough. We sell it on a 30 day trial. If you are not completely satisfied, return it within 30 days for a full refund. Priced at \$149.95, on snap-in ROM. Mastercard, Visa or COD.

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hard to read. A case in point is table one on page 45.

But I also want to congratulate you on a fine magazine and thank you for picking up the obligation of Briefcase Portable. I had a six-month subscription to Briefcase and am glad my money wasn't lost. Keep up the good work.

Roger Anderson
Sunnyvale, CA

We agree with your complaint. A change has been made.—Ed.

Thank you for the fresh new look. I extend my appreciation to all those who worked very hard to get the magazine that way and hope it will continue.

Daniel Brinnehl
CIS 75016, 1360

Congratulations. Portable 100 might not be a perfect magazine, but it sure is a dedicated one due to a loyal staff. Sometimes we readers have a tendency

to forget this. I'm with you all the way. Just keep daring.

G. Wilfred Vallee
Gagnon, Quebec, CAN

Promises, Promises

I take exception to one of your major advertisers and their "let the buyer beware" attitude.

I purchased the Business Pak Plus from Portable Computer Support Group (PCSG) in its infancy and was extremely pleased with most of the programs such as Write Plus and Telex Plus. However, Telex Plus didn't support Action Telex's 800-phone number. I was told they would supply an update to accomplish this.

After waiting several months, PCSG started advertising Telex Plus in another combination package. When I called again they told me, "It's not out yet" but they'd sell me that part since I'd been told it would be available separately.

During this time PCSG also was advertising the Chipmunk. I was very interested in this, but kept getting the same story.

So I've made other plans for Telex Plus and have purchased the Chipmunk from Holmes Engineering.

This letter was prompted by Carl Opedahl's flowery review of PCSG's Lucid in your March 1985 issue and his statement, "PCSG says a utility module may be released..."

Lucid interests me, but I'd think twice before ordering anything again from PCSG. They do a lot of promising but very little producing.

I love my Chipmunk. I hope that PCSG's history of promises, promises doesn't rub off on their marketing of it.

R.W. Russell
Albuquerque, NM

Stop That Scrolling

Here is a suggestion for users wanting to download a file at baud rates greater than 300 baud. Many users find that the scrolling of the screen prevents this. It's possible to assign the F6 and F7 keys in TELCOM to create a scroll/no scroll function. If the screen doesn't scroll, the 100 can accept data at a true 2,400 baud (Xon/Xoff disabled) without cropping data. The poke commands

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necessary are:

F6 Scroll Mode
POKE 64268,68
POKE 64269,66

F7 No Scroll Mode
POKE 64279,63
POKE 64271,66

When F7 is pressed, the screen doesn't scroll and all data prints on line eight. This makes the screen unreadable, but remember the purpose of this is to allow downloads. You can go back and read later. Pressing F6 returns TELCOM to scroll mode.

Unfortunately, the label key doesn't indicate this change. The user will have to remember which key is which, unless someone else can figure out how to change the labels in TELCOM.

David Clarke
Spartanburg, SC

Goodbye Geneva, Hello Tandy 200

I have just sold my Epson PX-8 Geneva. It was a tremendous disappointment. Send me a check for \$500 and I will tell you how to make it work. I have ordered a new Tandy 200 instead.

Dan Baker
Escondido, CA

Help for NEC-8201A Developers

There is a little-known book that's useful for software developers for the 8201. This book provides assembly language listings of ROM routines. It is PC-8200 Technical Notes, available for \$22.00 prepaid from NECHE, Inc., 1401 Estes Ave., Elk Grove Village, IL 60007, Attn: Carol Noonan.

Roger Knights
Seattle, WA

Alive and Kicking

I am amazed at the interest the 100 has generated in after-market support products. The development of Lucid, the

32K expansion chip by P.G. Design Electronics and the Chipmunk are fairly serious ventures in supporting this portable.

Do you think these products will continue to be developed now that Radio Shack has brought out its Tandy 200? How long do you expect this interest to continue? Do you expect a large number of 100 users to switch to the Tandy 200? How many 100s were sold by Radio Shack?

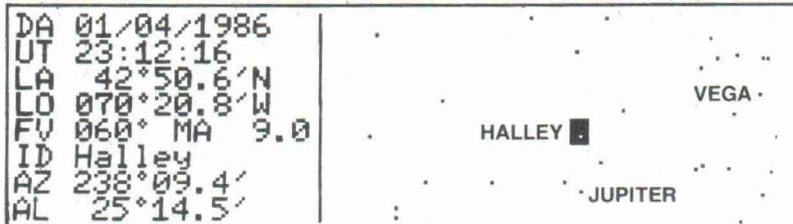
I've had my 100 for 15 months and it fits my needs. The Tandy 200 offers some

real advantages, but I can't imagine spending another \$1,000 for them.

Charles Conti
Durham, NC

Your concerns are valid. An upcoming feature article will compare the Model 100 and Tandy 200, and hopefully will answer your questions and those of other readers. —Ed. □

COMET WATCHERS - NAVIGATORS

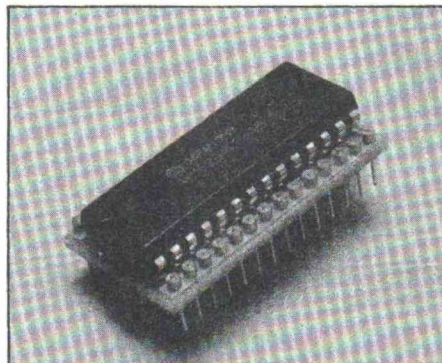


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BARGAIN CHIPS

Intel, the Santa Clara, California maker of integrated circuits (ICs) and microcomputer software, has reduced the wholesale price of its high-density complementary metal-oxide semiconductor (CMOS) memory chips.

The company's 256-kilobit (kb) dynamic random-access memory (DRAM) chips consume less power and generate less heat than conventional N-channel or P-channel MOS circuits.

The 51C256L DRAM was introduced less than a year ago with a price of

\$160.10 each in 100-unit quantities. According to Intel, economies of scale have driven the price down to \$22.75 per unit.

"Portable computers are certainly the most important application for these chips," says Intel's product introduction manager Charles Hart, who also cites battery-backed RAM disks and high-resolution graphics workstations as devices likely to use the new DRAMs.

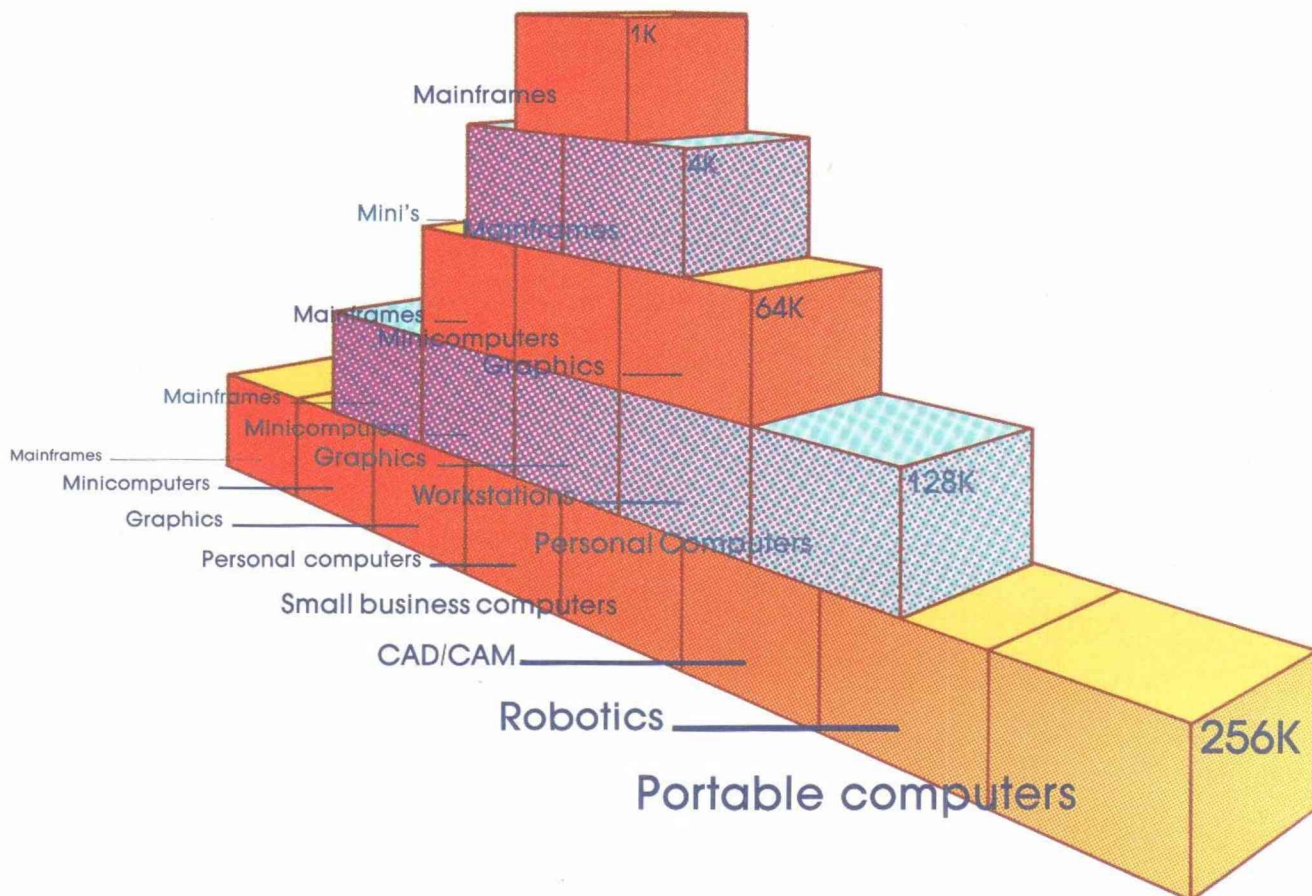
While the 51C256L has no immediate implications for Model 100 users, it suggests a direction for the evolution of fu-

ture portable systems. Designers will be able to include fewer ICs and reduce the cost of the computers. But the high-density circuits will provide RAM arrays of a megabyte or more.

The Intel chips are also more resistant to heat than conventional ICs, and are less likely to lose data as a result of alpha particles because their insulating materials tend to attract the particles and ground them harmlessly.

(continued on page 64)

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HERE COME 'DA BUG BUSTER:

A DEBUGGING PROGRAM FOR YOUR 100 or 200

BY DAVID D. BUSCH

This is the tenth in a series of columns by Dave showing how to program the Model 100 or Tandy 200 to program themselves. The sophistication of this column is intermediate.—Ed.

In previous automatic programmer examples, we've shown you how to let your computer write its own screens and assemble program skeletons. Now here's Program Proofer which allows a Model 100 or Tandy 200 to partially debug its own programs by checking the spelling of keywords and by finding some syntax errors.

Some program errors are caused by misspelled words that lurk within seldom-called code. Ordinarily bugs surface during program development because the interpreter will note a syntax error when a BASIC line is run.

The experienced programmer should test a program with many possible conditions and parameters in order to give each section of code a workout. Program subroutines should be tested both individually and in tandem with the main program.

In the real world such thorough testing is not always done. Errors may not be detected because the specific conditions that evoke a particular program line are rare.

In the worst possible situations these mistakes are hidden in error-handling routines designed to help the unsophisticated user. Sometimes they cause the loss of valuable data.

Program Proofer will check every line

of a program and detect all bad keywords. However, it will catch only typos. If you used LPRINT when you meant PRINT, the bug will slip by unchecked.

SPELLING CHECKER

Program Proofer was inspired by the plethora of spelling-checker programs which are now available. These useful software tools take any text and compare each word against an internal dictionary. Any word in the text that doesn't appear in the dictionary is flagged as a possible spelling error.

Our program works on exactly the same principle, but with a much smaller dictionary of 102 keywords. These are the reserved words named by Radio Shack in the Model 100 users manual. Extensions to BASIC for the Disk/Video Interface aren't included.

Program Proofer examines every word in a target program but ignores numbers, arithmetic operators and words inside quotation marks. The only letter combinations that are left are keywords, variables and misspelled words.

Although it would be possible to eliminate those of the remaining words that are variables — leaving only the incorrect keywords — that feature remains unimplemented in the current program. Consider it an exercise for your own programming efforts.

VARIABLES EXAMINED, TOO

Program Proofer also provides a variable cross-reference listing that includes line numbers.

Because variable names as well as keywords are examined you can look for variables that may have been spelled wrong. This is important to Model 100 and Tandy 200 users. With our version of Microsoft BASIC, only the first two letters of the variable name are significant. In other versions, PREVIOUS and PREVIUS are two different variables and can cause errors in programs.

This program handles most ASCII-format BASIC programs, which means that your programs must be saved in a .DO file. Multiple statements per line are okay. Keywords should have spaces separating them, and there should be a space between the line number and the first word in the line.

Even though random-access memory (RAM) is tight, you should try to write your BASIC programs with these spaces to make it easier to debug your code. Tightly packed listings are almost impos-

(continued on page 59)





	2	3	4
	January	February	March
Labor	2134.7	1679.67	1252.84
Materials	5946.87	4782.25	2371.48
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It takes our amazing Model 100 one step further.



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The Next Generation of Portable Computing

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Improved Word Processing Software

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Tandy 200 especially useful for journalists, salespeople, engineers students and anyone who needs to write letter-perfect memos, reports and correspondence in a hurry. Edit, delete and move blocks of text with just the touch of a function key. It's that easy. The Tandy 200 gives you the convenience of a personal word processor for use anytime, anywhere.

Four other "instant-on" programs let you use the Tandy 200 as your personal appointment calendar, address and phone directory, and telephone auto-dialer (the Tandy 200 generates tone dialing pulses, so you can use it with long-distance services). A much more powerful built-in program for communications makes it easy to access other computers by phone. You can even create your own programs in BASIC, too.

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The Tandy 200's high-contrast flip-up liquid crystal display has 240 x 128 resolution for big, clear graphics and easy-to-read characters. The 16-line by 40-character display makes the Tandy 200 particularly well suited to word processing and spreadsheet duties and with simple BASIC commands you can add dot-addressable graphics to your text.

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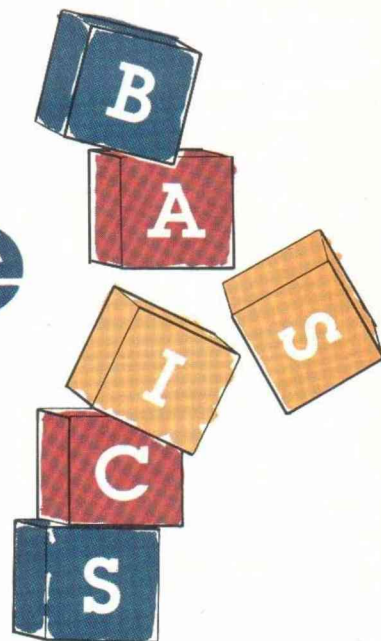
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Learning The



Bolster your BASIC confidence with this introductory lesson.
By Danny Goodman

If you're new to computing, perhaps having acquired your Model 100 because of its friendly portable typewriter nature, you may be intimidated by the prospect of learning to program for yourself.

This excerpt (part one of a three-part series) from The Simon & Schuster Guide to the Radio Shack TRS-80 Model 100 (1984) gives the non-technical user the wherewithal to mine the most out of the 100.

Author Danny Goodman is a computer and consumer electronics writer who has often graced these pages.

BASIC, by the way, is an acronym for Beginner's All-purpose Symbolic Instruction Code.

—Ed.

When you turn on the computer, you're presented with a menu of built-in programs including what for many may be a strange and terrifying option: BASIC.

If you've never learned BASIC or any other computer-programing language, the prospect of having a machine with it built-in may be either an exciting opportunity or something to fear. And if you look at Part III of the Model 100 manual, the unfamiliar and downright intimidating discussions of data types, control commands, input/output and the like may scare you off.

Of course, you don't have to be fluent in BASIC to derive a great deal of productivity and enjoyment from your machine. Nor is it my intention to tutor you in BASIC. But there are a handful of direct commands that you'll need occasionally in your operation of other applications programs.

These commands deal primarily with changing settings in your computer (such as the date and time) and entering

BASIC programs in several formats: cassette tape, printed program listings and electronically transmitted ones to your computer from other computers or bulletin boards.

BASIC DIALECTS

BASIC comes in all kinds of dialects and complexities. In many of the very inexpensive home computers on the market today, the BASIC language provided in the computer's ROM is a skeleton language, with just enough commands to perform only the most elementary functions. They serve their purpose as easy-to-grasp languages by having fewer words or commands in the vocabulary.

To take full advantage of the computer, however, you usually need to buy an optional BASIC, typically called Extended BASIC. This adds commands that let the creative user work more fully with graphics, sound and peripherals such as disk drives and game controllers.

The creator of most BASIC dialects available on home and professional personal computers is Microsoft Corporation of Bellevue, Washington. In its various levels of complexity, the language is called Microsoft BASIC, MBASIC or MS-BASIC.

The BASIC included in the 100 is a fully-featured Microsoft BASIC, to the delight of most experienced BASIC-language programmers. The dialect contains most of the sophisticated word (string) and number handling functions found on computers as powerful as the IBM

Personal Computer. Just about every meaningful command in the Microsoft vocabulary is offered.

The 100, because of features such as non-volatile memory, battery operation and function keys, has a number of extra commands to allow non-programers to tailor the computer's operation to their habits.

PROGRAM COMPATIBILITY

All Microsoft BASIC dialects contain many threads of commonality in the way the computer shuffles numbers and words around. But when Microsoft designs a BASIC dialect for a particular machine, the level of complexity and certain other characteristics are customized for that machine. Among these other characteristics are ways of displaying graphics and color information on a display screen, and handling communications with peripherals such as cassette recorders and disk drives.

A computer, by virtue of its unique physical design or features, may also have BASIC commands no other machine has. For these reasons, a Microsoft BASIC program written for one machine probably won't work on any other machine. That even goes for the 100 and the NEC-8201A.

COMMAND REPERTOIRE

Even though you don't have to know BASIC to get a lot out of the machine, it's helpful to know a few direct commands and how to assign many of them to function keys.

Once the operations are attached to

W
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M
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S
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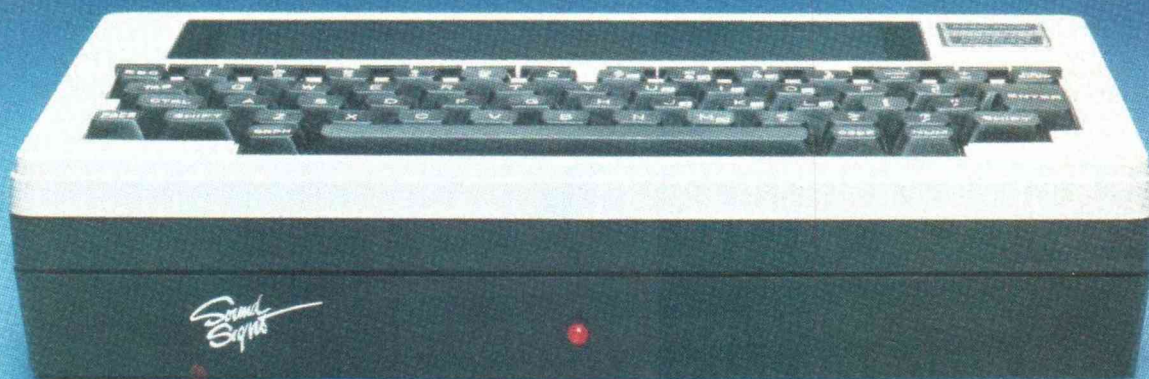
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- **does not detract from the portability of the Model 100** — fits in a housing that attaches neatly to the bottom of the computer, adding only 7 tenths of an inch to its height
- expandable up to a **half-megabyte as one bank** of memory — no switching back and forth between separate banks
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- we back our product with a 30 day money back guarantee and a full 1 year warranty — **satisfaction is guaranteed**
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Vice President of Regal
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"Since equipping my sales force with the Bubble Memory, problems that had us at a dead end have now been solved — it's a fantastic advance!"

SoundSight Magnetic Bubble Memory Inc.

BASIC

function keys, you practically can forget them since they'll be available to you at the press of single buttons. Rather than present these commands to you in alphabetical order, they've been grouped together according to the situations in which you might need them.

For the sake of convenience and consistency, we'll refer to two different hypothetical files throughout our examples. Any document file will be signified by LETTER.DO. BASIC program files will be called PROGRAM.BA. In our example commands, <ENTER> means you press the enter key after typing the command to set everything in motion. And luckily, the computer will accept your commands in both lower- and upper-case letters.

CASSETTE RUNS

Prerecorded programs for your computer are loaded into memory by way of the cassette port. In a cassette load, a copy of the BASIC program is sent to RAM. The original on the tape is unchanged and intact.

To load a program from tape, first enter BASIC by pressing the enter key with the menu pointer (the dark box) over the BASIC option on the menu. The menu screen disappears. In its place is the Microsoft copyright notice, the number of free bytes (spaces for typed characters) in memory, and Ok.

The amount of free memory shown in BASIC is slightly less than what shows on the menu. The reason for this is that the BASIC program takes some RAM (called overhead) to operate. The free memory figure in BASIC applies only to BASIC programs. For text entry, the free memory figure on the menu screen is the one to watch.

The letters Ok are BASIC's way of telling you the computer is ready to accept a BASIC command.

Next, make sure the cassette recorder is properly connected to the computer. If the tape isn't fully rewound, rewind it now. On some recorders it may be necessary to temporarily unplug the center, remote plug from the recorder to activate the rewind control. When the tape is rewound and all connections restored, you're ready to load the program.

ROLL 'EM

If there's only one program on the tape, simply type the BASIC command CLOAD (in either upper- or lower-case letters, or any combination of both) and press enter. CLOAD stands for cassette load.

Note that this is not the LOAD command available to you on the function

key (F3). This command has another function, which we'll cover shortly.

The tape should start rolling. You'll hear some scratchiness coming from the internal buzzer followed by a tone that ends abruptly with the slight click of an internal relay. The name of the program will be shown on the display like this:

FOUND: PROGRAM

Then a solid stream of noisy tones comes through the computer buzzer. This is the sound of data if you were to play the tape through an audio recorder. The tones will continue until the program is completely loaded. If the program is a complex one, it could take several minutes.

Occasionally there may be an error during the loading of a program. If so, the load will be stopped (aborted). You have no choice but to try again.

Assuming you get a good load, at the end of the program-tape section the recorder motor will stop and the Ok prompt will reappear. You're now ready to run the program by typing RUN and pressing enter. You also can use F4 (RUN). The program should execute automatically.

QUICK EXIT

Occasionally you'll find yourself in the middle of a program and want to leave it. In most BASIC programs, F1 through F8 won't be used, at least not according to the labels assigned to them by pressing the label key. Consequently, the menu option probably won't work to get you out of the program.

To leave the program, you break into the operation. This is simple. Press the shift key and the break key simulta-

neously. A message will appear on the screen indicating that program execution has been broken. The computer reports the line number of the command that was being executed when you pressed shift-break.

If you're not interested in the programming aspect then you can ignore that line number. What you're looking for is the Ok prompt. That means the function keys are back to normal (unless they've been completely redefined by the program — an unlikely situation). Press the key for menu (F8), and you're back at the familiar directory screen.

ONE MORE TRICK

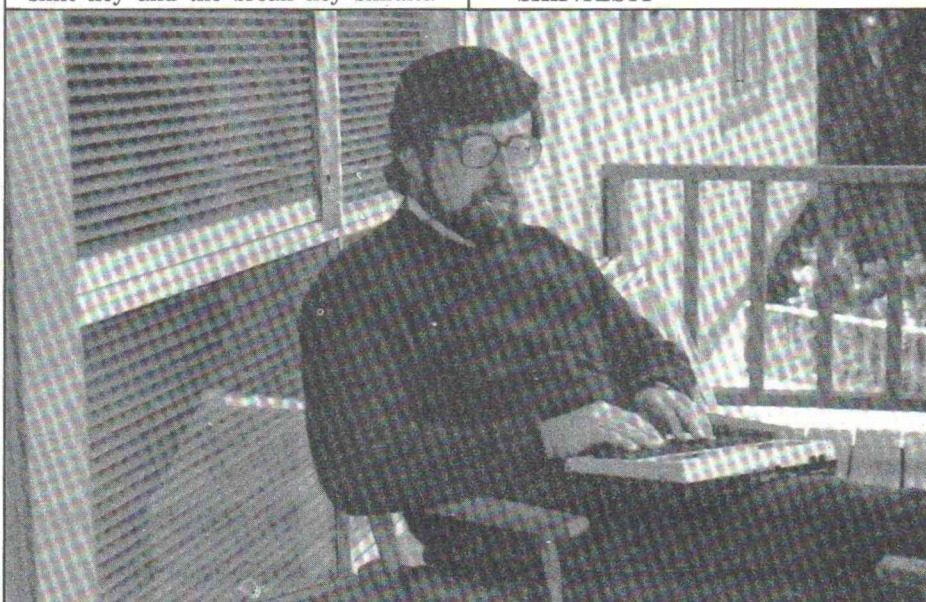
There's another hint to CLOAD you should know. If the tape you're loading has more than one program on it then you should specify the name of the program you want loaded. It's a good idea to keep a log of approximate tape counter readings for the beginning of each program or data file on the tape. That way, if you need a program in the middle of the tape, you can fast-forward the tape to the area in which the program should be located.

Actually, you want to stop advancing the tape before reaching the program location. When you issue CLOAD with the filename like this:

CLOAD "PROGRAM" <ENTER>

the computer knows to ignore everything it finds until "PROGRAM" is located. If the computer encounters a program called TEST1, for example, a message will appear on the screen like the following:

SKIP:TEST1



Text processing power that no other program can equal.

Write **ROM**®

on Snap-in™ Cartridge \$149.95

PCSG says "Send it back in 30 days for a full refund if you don't agree."

WRITE ROM is the definitive word processing extension for the Model 100. Less than two months after the Model 100 was announced Portable Computer Support Group introduced the very first text formatter for the Model 100. That program, called Write + was licensed to Tandy and is now in Radio Shack Computer Centers as Script-100. Write + had many powerful features and most reviewers still say it is the best of the cassette based text formatters. But now eighteen months later PCSG has introduced WRITE ROM. Those who experience it have said "WRITE ROM literally doubles the text processing power of the Model 100."

WRITE ROM is what you would have expected PCSG, the software leader for the Model 100, to develop in the 18 months since Write + was brought to the market.

First of all WRITE ROM as its name implies is on a snap-in ROM. You simply take a quarter and open the little compartment on the back of your Model 100 and press in the ROM cartridge. It is as easy as an Atari game cartridge and can be snapped in and out instantly so that you can use other ROM programs whenever you wish.

WRITE ROM appears on the main menu just like one of your built in programs. It lets you do every formatting function you would expect like setting margins, centering, right justifying and having headers and footers. But it does them under function key control, with the clear and easy to learn and use techniques for which PCSG has become famous.

In keeping with PCSG's long standing reputation for superlatively simple yet comprehensive documentation, the manual is a model of lucidity.

WRITE ROM remembers your favorite format settings so that you can print a document without any set up, but you can change any formatting or printing parameters instantly with a function key.

WRITE ROM's 'pixel mapping' feature shows you an instant picture on the screen of how your printout will look on paper. Incidentally, PCSG introduced this feature on the Olivetti M-10 version of Write + over a year ago.

In all there are 44 separate features and functions that you can do with WRITE ROM, and some of these features are truly breakthroughs for the Model 100.

First, WRITE ROM lets you do search and replace, with function key ease of course. Any word or phrase in a document can be searched for and replaced with any other phrase where the search words appear.

Second, WRITE ROM lets you send any text (formatted or not) to any other computer over the phone with just a function key. What's more, it dials and handles sign on protocol automatically.

Third, WRITE ROM has a wonderful feature called 'Library' that gives your Model 100 power that you never thought it could have. Library lets you record favorite phrases, words, or commonly used expressions (sometimes called boilerplate). Any place you wish any library text to appear in your document you just type in a code. WRITE ROM automatically inserts the text just like a Xerox Memory Writer.

The library phrase is inserted as your document is being printed rather than as it is being typed, so this feature conserves memory in documents where a long phrase is used repetitively, since each occurrence of a library phrase in your document is indicated by a single code character.

This Library feature is so powerful these two pages could be devoted just to telling you about things it can do. For example, you can have names and addresses that you designate in one text file with a customer or supplier number. Or you can have inventory items with stock numbers.

In your document you simply type in the customer or stock number and that entry from the other file is automatically inserted in the document. Picture what you can do with that kind of capability.

Because WRITE ROM is written in machine code, it is blindingly fast. No one can claim faster operation.

Because it is on a ROM it uses virtually none of your precious RAM for its operation, and it does not interfere with other machine code programs in your RAM. It works with any printer, serial or parallel. At the touch of a function key you can find the size of a RAM file in bytes and in words (ideal for journalists and other writers who need to know how many words are in a piece). You can make a duplicate copy of a document file under a new name. You also can rename or delete (kill) any RAM file with function key ease.

This description only scratches the surface of this amazingly powerful piece of software. You can automatically insert the date or the time anywhere in your document; WRITE ROM senses when you are nearing the bottom of a page, and at your command will start a new paragraph on the next page.

Write + was the Model 100 pioneer in the use of 'dot commands' to allow control of such things as margins, centering, line spacing and other appearance related changes in the middle of a document. WRITE ROM goes a step further by making all the dot commands Wordstar compatible. This means that if you wish you can quite easily prepare a Wordstar compatible document. Then you can use features of WRITE ROM (such as pixel mapping) that Wordstar lacks, before uploading to your desktop.

A Mail Merge feature allows you to send the same document to every name on your mailing list, personalized for each recipient.

WRITE ROM enables you to do underlining, boldface and correspondence mode as well as any other font feature that your printer supports in a way that is so unique many users say "It is worth the price of the program just to have this one feature."

Here's how it works: When you want to underline you don't have to remember

some complicated printer code. You just type Graph-U, and to end underline you just type Graph-U again. For boldface it's Graph-B and to end boldface it's Graph-B again. It's easy to remember and easy to do. WRITE ROM lets you record the codes from your printer's manual one time only and then just use these easy to remember signals any time you want to do a printer font feature.

WRITE ROM does so many things that other text formatters cannot do. For example you can not only double space but triple, quadruple or any other.

WRITE ROM allows you to use your TAB key in a document so that you can indent the first line for a paragraph easily or space rapidly over many tab stops.

WRITE ROM has another nice feature. It allows you to undent. This means that you can have paragraphs that have a first line that projects to the left of the remainder of the paragraph.

WRITE ROM allows you to not only center a word or phrase on a line but you can center copy vertically on a page as well.

WRITE ROM has a feature that is unique to any word processor on any computer. It is called FORM. FORM is an interactive mechanism that lets you create screen prompts so that you or someone else can answer them to fill out forms, or supply information like to a questionnaire or answer correspondence rapidly inserting personal answers into a form letter.

It works sort of backwards from Library or boilerplate. As you recall, with the Library feature you type a code into a document and when you print, that phrase or word or paragraph is picked up from the Library file and inserted into the printed document. With FORM when you print, anyplace where you had previously typed in a GRAPH T in a document, the printer will stop and you are shown a prompt on the screen. You can type in directly on the screen and when you press ESC, what you typed is sent to the printer formatted like the rest of the document.

What is really great is that you created those prompts that appeared on the screen. By the way, the prompts won't appear in the printed document unless you want them to, and you don't have to be connected to a printer, you can write your completed forms to RAM files if you wish.

Think of how you can use FORM. A doctor or nurse could use it for a patient's history with each question appearing on the screen. An insurance salesman could have

his entire questionnaire, or a police department could do a complete arrest report. You can construct a series of prompts to answer correspondence, automatically inserting the answers into a generalized letter format for a given type of correspondence, like customer service. This feature lets you answer letters in a rapid fire fashion each one with its personalized responses.

Before WRITE ROM you had to be a programmer to create a series of prompts to answer questions or record information. Now it is as simple as typing Graph T.

There are many other examples of excellent programming evident in WRITE ROM. The line feed problem of the Model 100 is dealt with by the simple use of a function key. Files are selected by moving the wide bar cursor over the WRITE ROM menu.

PCSG makes the claim that WRITE ROM is the easiest, fastest and most feature rich text formatter for the Model 100, as well as being the only one on a Snap-in ROM. You can do more with WRITE ROM than anyone thought possible for the Model 100. We at PCSG are happy to offer WRITE ROM because it expands the Model 100 to a dimension of text processing you cannot equal on even larger computers.

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BASIC

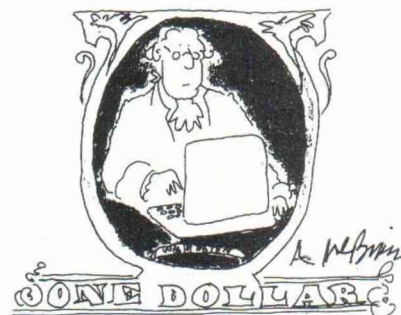
and the cassette motor will continue until the computer finds "PROGRM" and tells you it has found it.

Unfortunately, you have to listen to the squeals of data transferring unless you previously turned off the sound. But a benefit of loading a filename is that it allows you to determine a cassette's contents.

You can perform a CLOAD with a filename you know doesn't exist and watch the computer skip over the files. Every time a file is found its name appears on the screen and you can jot down the approximate tape counter reading.

FOR THE FORGETFUL

If you can't remember where on a tape a favorite program is located, you can perform a CLOAD "PROGRM" with the tape at its beginning, then go about your



business. When the computer finds PROGRM, it'll automatically load it into the computer and stop the recorder motor when done.

Moreover, if you want to have the computer behave even more automatically, you can perform a load in the following manner:

CLOAD "PROGRM",R <ENTER>

By adding the comma and R, you're telling the computer not only to locate and load the program but immediately to RUN the program once the transfer into RAM is complete.

NOTE

When you load a BASIC program it doesn't appear on the menu. You can switch between BASIC and the menu without losing your program. But anything you type in or CLOAD while in BASIC will damage or cover up the first program you loaded.

If you want to keep the program resident in RAM, with the likelihood you'll want to load another BASIC program before reusing the original, you'll have to transfer the first program over to RAM via the SAVE (not CSAVE) command. In other words, any program you CLOAD into the computer resides in a

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BASIC

kind of scratchpad, even though the program will remain intact when the computer is turned off.

But unless it's transferred to RAM and appears on the directory as a separate BASIC program (with the .BA extension), it's vulnerable to being erased by the CLOAD of another program or your experimenting with BASIC.

TYPING IN

Few tasks associated with a personal computer are as thankless as typing in a program from a printed listing. A medium-length program may require 3,000 or 4,000 keystrokes. More typically, however, a program listing will be under 2,000 bytes, with each byte representing a character or space entered at the keyboard. It's rare for anyone to be able to type in so many characters and not miss anything in the process.

The computer demands precision. It'll advise you without hesitation if you've made a mistake in entering your program. The sad part is the computer waits until it's running the program to tell you that.

But a few BASIC commands should help you get off to a good start and correct any errors that may have slipped in while you were typing. Let's go through an example of how you would type in a program.

CLEAN START

Since the computer has non-volatile memory, it's quite possible there's some leftover program or experiment in the BASIC workspace from the last time you used the computer. To make sure there's no extraneous information in the BASIC region of the memory, you issue the NEW command by typing NEW <ENTER> at the Ok prompt in Basic. Another Ok prompt appears, indicating the instruction has been carried out. By now six of the screen's eight lines have something on them:

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Ok
new
Ok

To clear the screen, type CLS <ENTER>. This clear-screen command leaves nothing except an Ok prompt in the upper left hand corner and the cursor directly below it, ready for you to start typing in the program. You can issue a CLS command at any time in BA-

FIVE VERY IMPORTANT REASONS WHY YOU SHOULD PROBABLY SKIP RIGHT OVER THIS MESSAGE



1. You're now getting all the value, benefit, power and pleasure out of your Model 100 that you need or want.
2. You simply can't use any more software.
3. Your own programing skills are finely honed and you can't benefit from handling the successful efforts of others.
4. You're not interested in saving quite possibly hundreds of dollars on software by availing yourself of good public domain stuff.
5. Or, worst of all, you're afraid your friends will think you're (gasp!) a hacker.

If, however, you could use more good solid application programs ready to run in your Model 100 or Tandy 200 . . . or games . . . or programing utilities . . . or graphics . . . or text formatters . . . then this message is indeed for you.

Or if you like the idea of getting maximum benefit out of your little computer and the time you spend in its brilliant, if arcane company, then, this is for you. And if you secretly like the idea of your acquaintances thinking you're not only a computer guru but quite possibly a personal friend of Stephen Wozniak, then . . .

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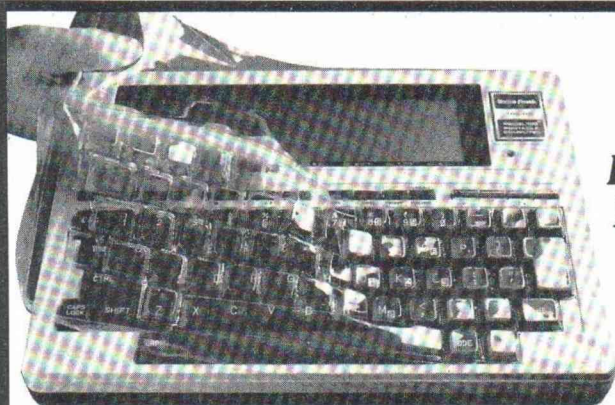
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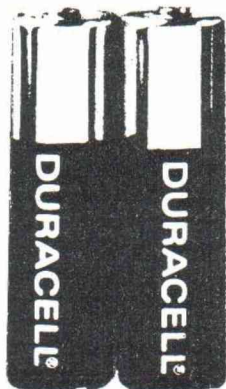
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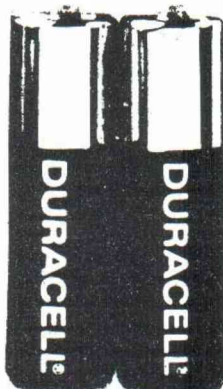
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BASIC

SIC. It doesn't harm the program you're running or entering. It clears the visual garbage that may have collected.

LOGICAL LINE

If a line of data extends beyond the right margin of the screen, just keep typing until you come to the end of the statement in that line. The information on that line will wrap around to the next line, breaking words in the middle. This is perfectly normal.

You shouldn't press enter until you're at the end of what is known as a logical line, or after all the data for that line number has been typed. A long logical line could occupy more than six lines of your 40-character wide liquid-crystal display (LCD) screen.

Above all, be accurate with your transcription. Every letter, number, punctuation mark and symbol you see in print must be typed in precisely the same sequence.

SPACED OUT

Unfortunately for the newcomer to the language, the BASIC in these machines allows the programmer to condense the instructions without putting spaces between elements within a line. This makes listings very hard to read, and thus more open to mistakes in transcribing.

There's a side benefit, however. Every space that's left out means one more byte of free space for another application. It could mean a couple of hundred extra available characters for a text file you're writing while on the road.

ERROR

After you've typed in the program and RUN it the first time, there's a high probability the program will stop to issue some kind of error statement and a line number. When this happens, LIST the line to display what you typed for comparison against the original. A typical exchange might start with the computer's error message:

?SN Error in 110

Next you type:

LIST 110 <ENTER>

Then the line appears as you typed it.

If there's absolutely nothing wrong with what you've typed, then there might be a mistake in the original listing — it happens occasionally. But more likely, you've made an error in typing the line.

It's too bad the error messages come out with the word error. To new computer users the word connotes a human mistake. In this case, though, the error-

BASIC

finding capabilities of the computer are actually helping you find and solve potential problems.

THE FIX

You have two ways of fixing the mistake. One is to retype the entire line. Even though you'll be typing the line seemingly out of sequence with the rest of the program, the computer knows to put it in its place. But if the line is a monster, filled with all kinds of symbols and characters, there's an easier way: EDITing the line.

After listing the line to see what the mistake was, you type the command EDIT 110 <ENTER>

Inside the 100, the BASIC program is put aside for a moment, and the suspect line is brought over to TEXT. At this point you have the power of the text program at your disposal. You can insert or delete whatever characters are needed to make the line correct.

When you're done making corrections, press F8. This special keystroke breaks you out of the editing cycle and returns you to BASIC, with an Ok prompt appearing in the upper left corner of the screen.

FAST EDIT

Sometimes, when you're entering a large program with many series of lines that look alike, you may find in your comparison against the printed program that you've messed up several lines in a row. Rather than edit each one individually, there's a faster route. Still using EDIT, specify a range of line numbers you want to fix, like this:

EDIT 110-150 <ENTER>

On the 100, all program lines from 110 to 150 inclusive will be copied over to TEXT for editing.

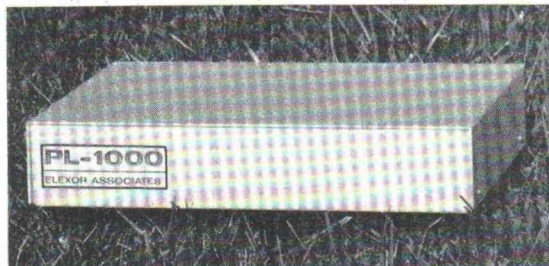
When all lines are as they should be, press F8 to get out of edit. A lot of shifting of information takes place on the way to BASIC. In long BASIC programs, the rearrangement of your repaired lines could take several seconds. A wait signal flashes on the LCD screen while the transfer is taking place. As long as the signal is flashing, everything is running smoothly.

As you've learned by now, the gateway back to the directory is the MENU command. Any time you have an Ok prompt in BASIC, you can type MENU and press enter or use F8 (MENU) to return to the opening screen. □

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aircraft." Only the size and weight criteria of carry-on baggage determines whether the computer is allowed on board.

United Airlines banned the use of portable computers in the fall of 1983. At the time there were only eleven available portables on the market. United used both its San Francisco and Denver facilities to test each of the available machines. According to Kay Lund, United's director of corporate communications, "no interference to aircraft communications or navigation systems was found."

United then revised its policy in January, 1984 to allow use of the portables, but reserves the right to ask passengers to turn off the computers if interference is encountered on any flight.

Computer author David H. Ahl reported that he has twice been stopped from using his Model 100 during United flights.

"United will continue to test new products of this type and is active in the RTCA," adds Lund.

TESTING, 1-2-3

As of this issue of Portable 100/200, RTCA Special Committee 156 has not resolved the problem of flying computers or come up with a position on their in-

flight use. Jim Lohr of the RTCA maintained that the committee is testing the equipment over a wide "frequency spectrum" and probably won't have a report ready for release until late summer, 1985 at the earliest.

Frontier Airlines senior director of customer services Kenneth L. Burgess says that airlines is awaiting the RTCA report and will react accordingly to any subsequent change in the FAA's regulations. "Frontier Airlines does not have the ability to make proper interference tests," said Burgess.

Currently Frontier allows portables on board only as hand-carried baggage. According to Burgess, "The units must be in unpowered status while on board the aircraft. We expect some relaxation of the regulations regarding computer use following release of the RTCA's study."

Swissair allows electronic equipment to operated on board as long as no use of an antenna is required. According to Maura Raphael, Swissair's public relations coordinator, "the computer must be within the normal hand-baggage allowance and dimensions: linear dimensions of 45 inches (115 cm) representing the sum of the three outside linear dimensions — length, width and height." Full

and unrestricted use of portable computers is allowed.

Air France has a policy similar to that of World Airways, according to Mr. Getard Priolet, flight operations manager. "If the technical crew observes malfunctioning of on-board equipment of instrumentation, it will notify the stewards to make a check on the possible use of an electronic device by a passenger." He added that to date the use of electronic quipment has not caused any incident.

HIGH ALTITUDE REPORTING

Harry Lipman of the Orlando Sentinel was one of many reporters using the 100 while covering last fall's political conventions on press planes. Lipman, quoted in a New York Post article, said he composed his stories on board: "As soon as we got off the plane we'd just run and file," he said. He sent his copy over the wires to the Florida newsroom using the 100's built-in modem.

DON'T GET STUCK AT THE GATE

But while it's getting easier to use your Model 100 in-flight, new problems are cropping up on the ground. The United States Customs Service may seize a port-

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FLYING

able computer or impose heavy duty penalties on it when reentering the U.S. from a foreign country.

There are two ways to avoid these Customs problems. The first is to carry proof of domestic (U.S.) purchase. This may be a sales slip with the unit completely identified, including all serial numbers of all components. The second and more reliable method is to register with the U.S. Customs Service all computer equipment being carried abroad before it leaves the country.

To pre-register you must bring the equipment to a customs office. Most large cities have one listed in the phone book. There you'll fill out a form listing every separate component and its complete serial number. After inspecting each item and number, a customs official validates your list.

Taking a computer out of the country is a relatively simple procedure, unless you are going to certain Eastern bloc countries listed on the Department of Commerce Commodity Control List. Bringing a computer to those countries may require a license and a verification later on that you returned the unit to the United States.

Export of computer equipment or tech-

nology is forbidden to those countries under provisions of the Reagan administration's "Operation Exodus".

A computer bought in a foreign country and brought home as a souvenir may be seized by U.S. Customs. Many Apple- and IBM-compatible units and publications are listed with the Customs service as being infringements on U.S. patents and copyrights. The International Trade Commission has directed Customs not to allow the importation of such units.

EXPLOSIVE ISSUE

A final problem for the flying-portable computer may be encountered in airport security systems.

Chris Sochan, a spokesperson for Lufthansa German Airlines, confirmed this in a telephone interview. "The airlines themselves are now saying, 'we don't have any problems with portables' but the airports are going to restrict their use.

"Although we will allow them on board and (passengers) can use them," she continued, "the passenger will have difficulty in Germany getting them aboard because of security reasons.

"There's no way," she added, "that the customs or security officials at the airport

can open up this computer to ascertain that it is indeed a computer and not perhaps some elaborate bomb."

An Air France plane from Frankfurt was destroyed recently by a skyjacker's explosives. "It's recognized that Frankfurt is one of the strictest airports in the world," said Sochan. "And for them, it's frustrating to imagine how they ever got this on board — some of these guns and explosives — so a compact sealed unit like a computer is going to drive them crazy!"

WRAP UP

In summary, the current situation is as follows:

1. Airlines are becoming more liberal in their policies allowing onboard use of portable computers. In many cases, the individual flight crew is the determining authority for portable use.
2. Some airlines which now ban in-flight computing are awaiting clarification from the FAA, which is awaiting a report from the RTCA.
3. U.S. Customs inspectors, operating under various government guidelines, may refuse the importation or export of certain computers and components to and from listed nations.

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4. German and other airport security personnel may refuse to allow the portable computer to be passed through the security system, and thus may prevent the traveler from any on-board computing.

Any traveling 100 user contemplating in-flight computing should check all outstanding regulations of the airline, the airport and customs regulations of departure and arrival points before toting the portable computer to the airport. □

Please help us rate this article's overall value. If you found it very valuable, circle 135 on the reader service card. If it was moderately valuable, circle 136 — and if it wasn't valuable to you, circle 137.



Who's Responsible? Question Still Up in the Air

By Robert J. Rydeen

The furor over using portable computers on airplanes is certainly justified. Unfortunately the collective uproar is somewhat misdirected.

The basic issue is not whether portable computers cause interference. Rather, who is going to accept responsibility not only for the necessary testing but also for the results of their airborne use? Through all the ballyhoo, that has been overlooked.

Pending a Federal Aviation Administration (FAA) decision, everyone jumped on the condemnation bandwagon. But now it appears that nobody thought there was a serious technical interference problem. And the FAA, our nation's appointed guardian of the skies, has granted blanket approval — provisionally.

So if something goes wrong during a flight, the airlines must prove beyond the

shadow of a doubt that they took every possible precaution. The FAA's nebulous stance leaves open the question of responsibility — and puts the onus of proving liability on the airlines themselves.

The opinion expressed here belongs to Bob Rydeen, a frequent contributor to Portable 100/200 on the NEC scene and a former television reporter and photo-journalist. Today he's chief executive officer of a rapidly growing design corporation, while in his spare time he's a pilot for Eastern Air Lines. More than 10 of his 18 years as a pilot were spent in airport safety, operation analysis/training and accident investigation for the Eastern Air Lines Pilots Association.
—Ed. □

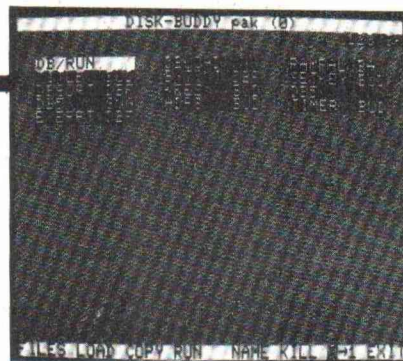
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- Also: Features to run, load, save, sort, kill, measure, append, and name, disk files and RAM files, and much more.

PCM Magazine (March, '85) said: "... an excellent buy" ... "manual is extremely well written" ... "will substantially increase the speed and ease of operation of the M-100 with the D/V/I."



That was the idea in the first place.

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RS4



Current Policy Concerning In-Flight Computing On Some Airlines

* * *

The passenger planning to use a portable computer while on board should check with a member of the plane's flight crew, regardless of the airline's stated policy. In all cases airline crews may demand the unit be shut off at any time should the operation of the computer appear to be hazardous to the flight.

In some cases airport security may refuse to clear a sealed-unit computer for admission to the airplane.

<u>AIRLINE</u>	<u>IN-FLIGHT USE?</u>	<u>RESTRICTIONS</u>
Air France	Yes	None
American Airlines	Yes	No remote-control, umbilical-cord keyboards, or accessories
British Airways	Yes	Self-contained units only; no external power-pack
China Airlines, Ltd.	NO	Unpowered, treated as hand baggage
Delta Air Lines	Yes	Self-contained units only
Eastern Air Lines	Yes	No external battery-packs
Frontier	NO	Unit must be in unpowered status while on-board aircraft
Japan Air Lines	NO	Unit must be in unpowered status while on-board aircraft
Lufthansa German Airlines	Yes, but...	German airport security may refuse to pass unit for boarding
Pan American World Airways	NO	Treated as hand-carried luggage until a FAA ruling is received
Qantas		At crew members discretion
SAS - Scandinavian Airlines System	Yes	No external power units
Swissair		Self-contained units only
TWA - Trans World Air	Yes	None
United Airlines	Yes	Also allows use of accessory printers and tape-drives if no radio interference results
World Airways, Inc.	Yes	Notify flight attendant - crew will be on the alert for possible problems

HARDWARE HACKING FOR HOOSIERS

They're doing electronic kit-building in Northern Indiana. Leesburg's new computer group supports portables, but especially accepts desk-tops so no machine is left out when members do their hardware hacking. Sysops Greg Stoddard and Darrell Young report at least 90 percent of their electronic creating will be computer-related.

The group is up and running with an experimental bulletin board system (BBS) that consists of the 100 operating with Bricom Systems BBS Software and a homemade auto-answer circuit. Plans are underway for adding a 4,800-baud tape streamer and a 60-kilobyte (K) solid-state disk (60K) this summer. And by the time users read this the system will be private, with passwords and guidelines issued to members.

Organizers of the Leesburg bulletin board system (LBBS) request a \$15 donation for annual membership. Proceeds cover the system's operating costs and memory expansion. A newsletter is in the works.

Operating hours are 2 p.m. to 10 a.m. Monday through Thursday, and midnight to noon Friday through Sunday. (All times are EST.) Set your modem on the Model 100 for M711E and telephone (219) 834-4025.

Sysops Stoddard and Darrell ask those interested to write LBBS, Rt. 1 Box 263-10, Leesburg, IN 46538 or use the BBS phone number. Callers are asked to keep messages short and to read the Help/Info file when they log on. "Anything we do on the LBBS is also available to users on hardcopy," the sysops tell us.

Virginia Reeling

Richmond, Virginia 100 owners have rediscovered the Chipmunk. At their latest meeting both the disk drive and Portable Computer Support Group's Lucid were demonstrated.

Newsletter editor Bob Ripley reports he has a data-base manager available that'll print labels, postcards, letters and sorted lists. It's free to all members.

He's also put together a handy refer-

table one
List of Current Drawn by the 100 During Various Operation Modes

Devices On	Total Current*	Approx. Battery Life
32K Model 100	57.1	20 hours
printer connected, off	89.5	13 hours
printer connected, on	59.1	20 hours
cassette motor on	109.5	10 hours
RS232 cable connected	59	20 hours
modem on in TELCOM	150	7 hours
printer connected & off, modem on	183	6 hours
Chipmunk connected	58.9	20 hours
barcode reader on	98	13 hours
Model 100 off	1.2	41.6 days

* milliamps

ence table to keep 100 users charged. (See table one.)

It's Official

Model 100 users in the Boston area have joined the big league. Boston.100 is now an official user group of the Boston Computer Society (BCS) and has been rechristened the Lap Computer User Group.

Anyone with questions can call (617) 262-2300, ext. 3298 or E-mail 71256,757 on CompuServe. The group holds its monthly meetings at the Boston Globe building.

NEC'ing in Oakland

A couple of NEC owners in Oakland, California have kept up with the deluge of computer books, specifically those for the 8201. Bay Area NEC/100 User's Group member Terry Crawford offers this review:

Exploring the NEC PC 8201A by Marvin C. Mallon (Holt, Rinehart and Winston, \$14.95) contains "... essentially what one could find in the NEC manual, but better organized and expressed. It should

prove useful to the uninitiated but probably won't have much appeal to the experienced user."

While visiting the Bay Area, William Grenke of Washington, DC told the group about a soon-to-be published NEC book: Using the NEC 8200 Portable Computer, by Keniston W. Lord, \$16.95 (Reston Publishing Co., Reston, VA 22090).

Grenke also told NEC users that the NECHE bulletin board isn't just for the NEC 8401. NEC 8201 users are accommodated too. The phone number is (312) 364-0048.

Undocumented read-only memory (ROM) changes in the Model 100 have caused NEC owners to wonder if the same has happened to their machines. Apparently the altered ROM has frustrated some hackers.

Member Dan Norgard offers this checksum so you can see if your NEC ROM has been tampered with. Enter the following: DEFDBL T: FOR A = 0 TO 32767: T = T + A * PEEK(A): NEXT: PRINT T: BEEP

The checksum is based on multiplying the address by the contents of an address for all of ROM. If you do not get 67394679600 this group wants to know. They also request you send them the serial number of your NEC so the changes can be identified. According to Norgard, all NECs he knows about have checked out okay.□

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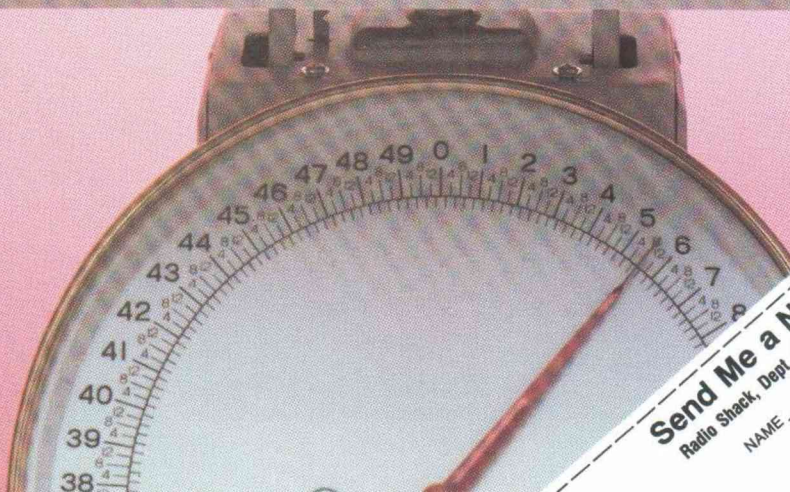
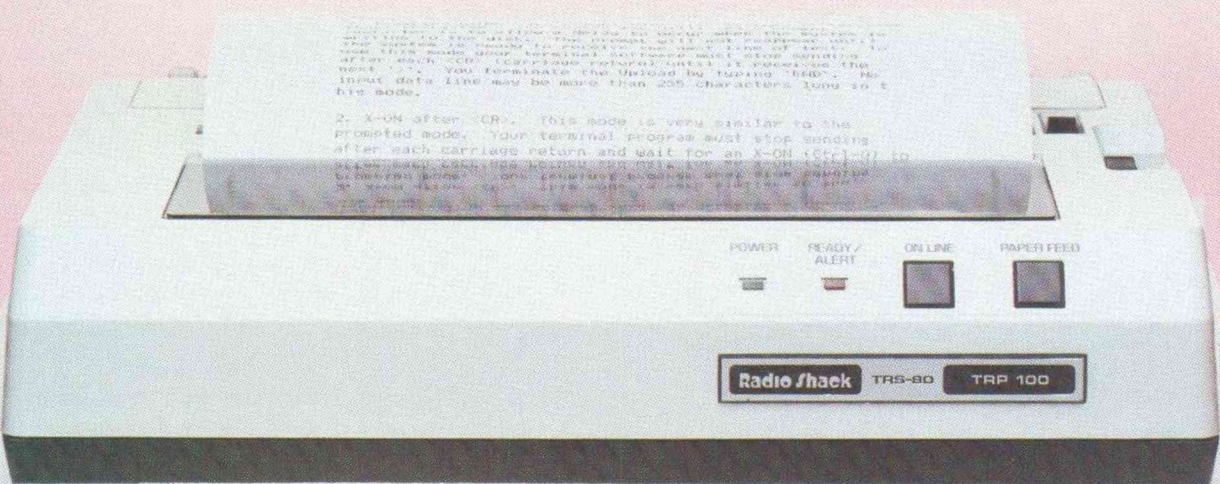
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can be eliminated from the menu display with the BASIC command LFILES OFF. The program uses 4,218 bytes of random-access memory (RAM) during operation, but requires 5,067 bytes of free RAM for loading.

The CDOS menu is similar to the 100's RAM menu. Line one indicates that CDOS is running; line eight lists function key definitions. In between, the files in the Model 100 are listed as they normally are.

Function keys allow users to save and

load files (either individually or all at once), kill or rename files, format a disk, return to the Model 100 menu, determine a file's length or available RAM, or access the disk directory.

Saving a file is as simple as placing the cursor over it and pressing Enter. Loading and running a program is just as easy. In addition, CDOS enhances BASIC, TELCOM and the 100's printing features.

The operating system reads and writes data in sequential or random access fashion. This powerful feature is lost on

the non-programmer. But for anyone who's dabbled with RAM file input/output it's a godsend. It lets users manage data-base records on disks instead of RAM-files, bypassing the 100's 32K limit and working with files of 300K or of greater proportions.

CDOS adds two functions to TELCOM. F6 lists the 100's RAM files and F7 reveals how much RAM is available for downloaded files.

The operating system also lets you decide whether to send a line-feed with each carriage-return character sent from the 100 to a printer. Tandy printers supply a line-feed when they receive a carriage return. Other printers require the computer to send the line-feed. CDOS gives you control over this situation.

CP/M-BASED

The PIC Disc's operating system is CP/M 2.2 by Digital Research. Like other manufacturers incorporating this system into lap-tops, PIC claims its system runs CP/M programs operating in a 64K environment. PIC Disc provides an additional 32K of RAM to enable the Model 100 to do this.

But unlike other CP/M-based lap-tops, the 100-cum-PIC Disc runs programs written for desk-top computers with 24-line, 80-character screens. PIC accomplishes this feat by storing display information in a buffer. The 100's LCD acts as a window on the 24-by-80 virtual display in the buffer.

A one-line BASIC program loads CP/M, redefines the function keys and stores the 100's RAM contents on a disk — a process that takes about 43 seconds. When it's over, the screen clears except for the CP/M command-level prompt, A>.

NEW FRONTIER

At this point, the familiar Model 100 world is gone. Function key definitions are not displayed on the screen, even when the user presses Label. Nor do the keys perform operations. Pressing a function key prints a command on the screen. To execute the command, the user must hit Enter. It's a small point, but worth emphasizing: using the PIC Disc isn't like using the 100's built-in programs.

Function keys allow the user to evoke a disk directory (F1), determine the space available on a disk (F2), rewrite the system tracks on a disk (F3), transfer document files from the Model 100 (F4), load T/Maker, an integrated software package that is included with PIC Disc (F5), format a disk (F6), copy files from disk to disk (F7) and return to the Model 100 menu (F8). These functions can be changed from the operating system.

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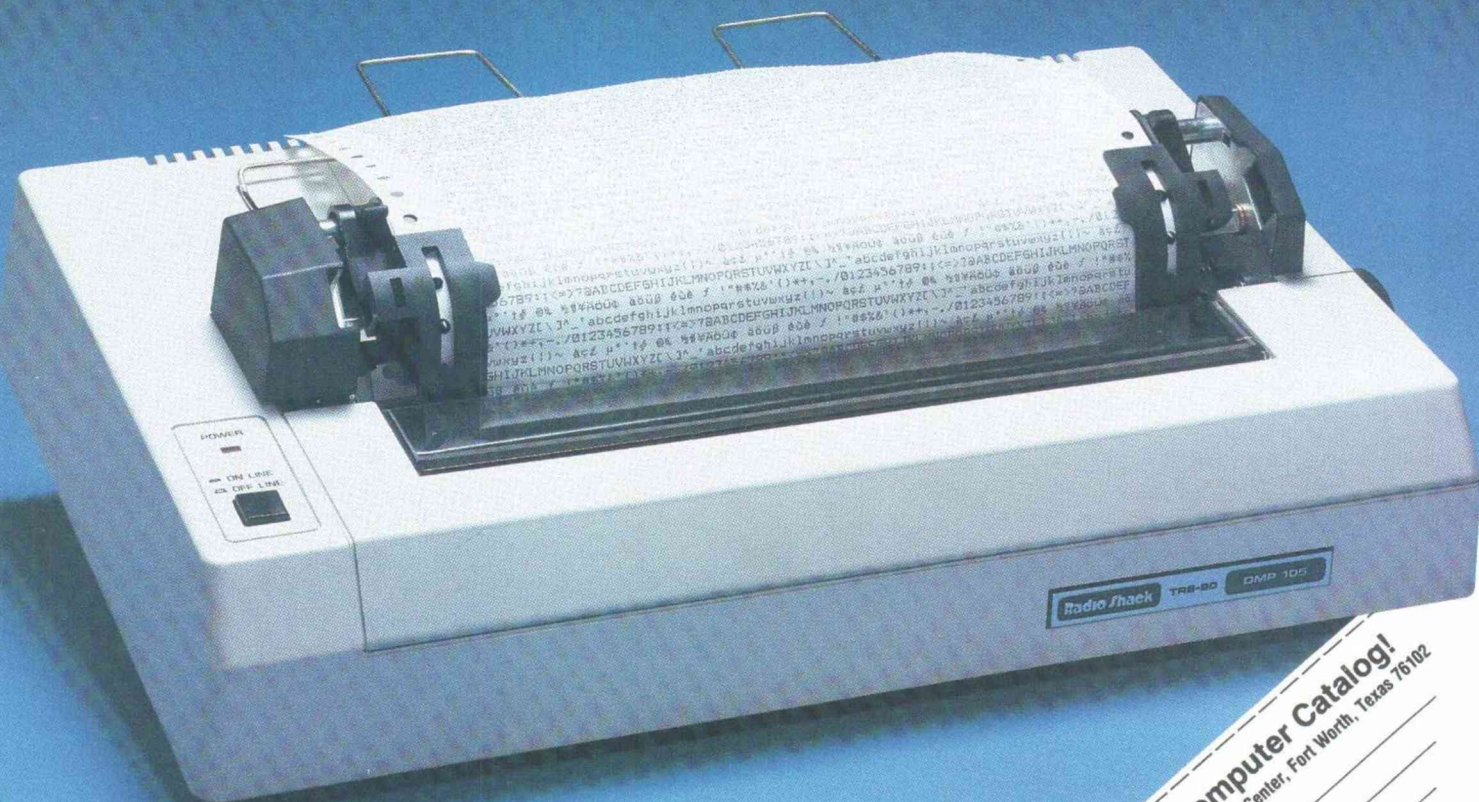
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43	19	Elexor
57	20	Fort Worth Computers
62	23	KJM Development
57	24	Kangaroo
27	25	Loquor
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DISK DRIVES

FLASHY BUT OVERWHELMING

T/Maker, a sharp integrated software package, is bundled with the PIC Disc. Separately, the program retails for \$450. T/Maker comes with a thick manual that weighs as much as the Model 100. The program provides word processing, electronic spreadsheet, data-base management, graphics, list-processing and spelling-checking functions.

T/Maker runs fine on the 100, with one inexplicable drawback—it replaces the 100's character set with a less readable font. No explanation is provided.

The PIC Disc package also includes Modem, an adaptation of the original CP/M modem communications program written by Ward Christensen. This error-checking program lets the user bypass TELCOM and telecommunicate from within CP/M applications.

There's no question that the PIC Disc's bundled software package provides an impressive array of functions, but none of its features are particularly well-suited to portability. Users who need integrated software generally use desk-top computers. T/Maker is as complicated as it is powerful. It may not be what Model 100 users want or need.

TOEING THE BOTTOM LINE

The Chipmunk and the PIC Disc perform adequately, each of them providing convenience and speed far beyond conventional cassette storage systems. In a benchmark test for saving an ASCII file, the Chipmunk saved a 16.25K file in 29.63 seconds. The same file was loaded in 16.25 seconds. Although these tests couldn't be performed on the PIC Disc because Model 100 BASIC programs don't work under CP/M, the unit's save and load functions operate with similar speed.

Backups are easier with the PIC Disc, which includes a disk-copying program that repetitively loads a portion of the disk's contents into RAM, prompts the user to swap disks and saves the data on the new disk. The Chipmunk requires manual file backup.

The pre-production Chipmunk documentation provided to Portable 100/200 was easily navigated and clearly written. If the production version maintains those standards, users should have no trouble.

The PIC Disc's documentation includes an operating manual (38 pages, five appendices), a CP/M command summary guide (45 pages), a separate T/Maker manual and two T/Maker quick reference guides. The operating manual is easy to follow despite several typos and English syntax errors. T/Maker's documentation is slick and colorful, but disorganized. It

took 10 minutes to find the command to exit the program and return to DOS.

RENAISSANCE DISK

Both drives are terrific improvements over the only disk drive Model 100 owners have had to date, the DVI.

If a Model 100 owner wants sophisticated software and CP/M, then PIC Disc is the one to choose. It provides the best lap-top implementation of CP/M.

But for anyone enthusiastic about the future of the Model 100, the Chipmunk is a must. The unit has found widespread acceptance and is the de facto portable disk drive standard for Tandy's tiny portable. As more software is released in its unique microfloppy disk format, the Chipmunk will become more and more vital to productive use of the 100.

The power it lends to the Model 100 will create a renaissance for the computer, even in the face of the coming 16-bit portables. □



FULL-DUPLEX (from page 10)

during an upload but no trouble typing, the problem could be the control protocol. With XON/XOFF protocol, the receiving computer sends XOFF when it wants the transmitting computer to stop and give it time to work. XON is sent when it wants the transmission to resume. This prevents the receiving computer from missing some of the transmitted bits while it is doing something else.

The other type of protocol is hardware-oriented, via the CTS (Clear-To-Send) and DSR (Data-Set-Ready) lines. The Model 100 sets the DSR line low when it has data ready to go. The receiving computer sets the CTS line to the appropriate level when it is ready to receive data. These are lines four and five of the RS-232 cable.

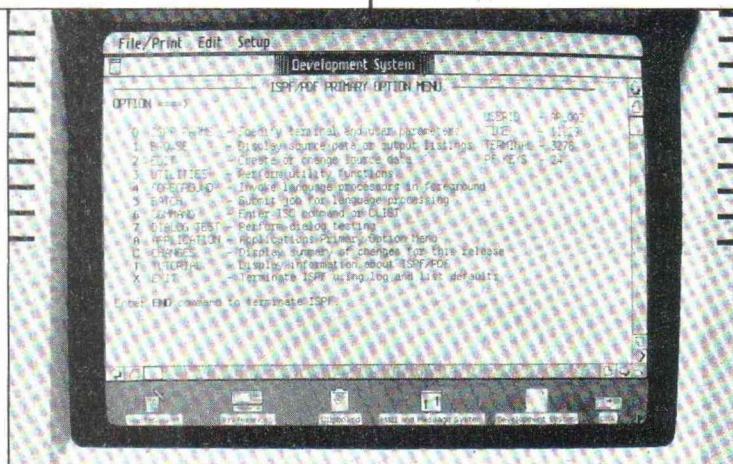
The protocol you choose can cause or relieve the problem. If the Lisa supports XON/XOFF protocol, setting both machines with this should allow error-free communication. If the Lisa software only supports hardware protocol, you may not be able to solve the problem.

The RS-232 standard isn't all that standard. For the hardware protocol to work, both machines must use the same signals to signify ready and not ready. Because the 100 uses a low signal to indicate data ready and the Lisa expects to see a high

signal for data ready, you'll have problems getting the two computers to communicate when relying on hardware protocol.

You shouldn't have any problems once you get both computers using the same parameters. Verify that the software isn't interfering. I've successfully used 47E1E to communicate with an Apple III, so you shouldn't have problems with the Lisa.

Full-Duplex is your column. It's dedicated to solving users' problems. Address your questions to Terry Kepner, P.O. Box 481, Peterborough, NH 03458. Please remember to include a return address with all Full-Duplex correspondence.
—Ed. □



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RS1

THE DATAPORT REPORT

Dataport/CS has produced an internal high-speed modem for the NEC PC-8201A computer. This modem features auto on/off, login and selectable 300, 1,200 and 2,400 baud rates for \$275, installed.

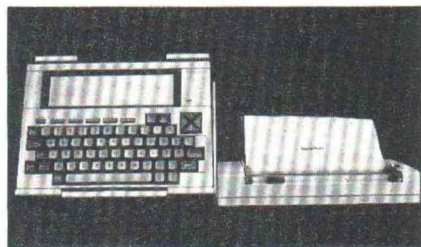
The modem is full-duplex, originate only. It's installed by Dataport/CS, usually within 24 hours of receipt of the NEC PC-8201A.

Tempest shielding of the modem is available for classified applications.

Dataport/CS also has announced an enhanced letter-quality portable printer, the Dataport LQ. This \$295 battery or line current-powered printer measures 8.5 inches by 11 by 2 and uses standard Centronics-type cables. Maximum speed is 15 characters per second. The printer uses any standard 8.5-inch wide paper.

For either of these products contact Dataport/CS, 5525 Olinda Road, Building C, El Sobrante, CA 94803, (415) 233-2530.

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Model 100, Where Am I?

Interested in teaching your Model 100 to fly? If so, Eagle Air Services and Doctor Preble's Programs each have airplane navigation programs for your computer.

NavEasy, by Eagle Air Services, is a sophisticated flight navigational planning system that requires a 32K Model 100. The program's license fee is \$399.95 and features screen displays of standard WAC flight charts. It continuously plots aircraft and airport locations.

Its calculation functions include fuel burn (for minutes of fuel remaining), great circle navigation, flight planning for up to a nine-leg trip and continuous statistics such as true airspeed, wind aloft,

magnetic heading, ground speed and estimated time of arrival.

NavEasy's files contain standard charts, a 100-point regional data base of airports, VORs, NDBs and usable radio transmitters in the country. For additional fees, other charts and data points can be added. Eagle Air Services also plans to offer customized data bases and charts by cassette and modem.

NavComp, from Doctor Preble's Programs, is two programs in one \$34.95 package. NavPln is for navigational planning and NavAid for real-time use during a flight. Both can be used in a 16K system.

NavPln will prepare information for a trip of up to 10 legs, calculating rates of climb and descent, indicated airspeed, cruise altitude, radio frequencies, magnetic variations, distances and checkpoints.

NavAid simulates your flight in real time. It displays information — airspeed, ETA, distance to next checkpoint, magnetic headings and fuel consumption rate — for comparison with the plane's instruments. It also reminds the pilot to start descent if there's a low fuel reading.

For more information on either program contact the respective addresses: Eagle Air Services, 1501 East Chapman Ave., Suite 258, Fullerton CA 92631, (714) 998-5016; Doctor Preble's Programs, 6540 Outer Loop, Louisville, KY 40228, (502) 966-8281.

Circle No. 101 on RS Card

Stand Up for Your Printer

A new printer stand, the Write Angle, has been announced by Northeast Peripherals of Somerset, New Jersey.

The one-piece clear acrylic stand comes in three sizes for 9.5, 13, and 15-inch printer carriages. Paper is stored underneath the printer. The unit is tilted for easy viewing of text being printed.

The Write Angle 9.5-inch print stand is \$29.95. The larger stands are \$39.95. For more information contact Northeast Peripherals, R.D. 1, Box 44, Somerset, NJ 08873. In New Jersey call (800) 272-1321,

extension 120; elsewhere call (800) 526-0988, ext. 120.

Circle No. 102 on RS Card

Computer Choo-Choo

Chattanooga Systems Associates has announced its Autopack of software — eight programs for the Model 100 and the NEC PC-8201A on a single cassette.

At \$89.50 plus \$2.00 for postage and handling, the Autopack contains the Autopen word processor, Autopad spreadsheet, Autobase data-base manager and Autosort sorting utility. It also includes: TFILE, a tape file utility; TRIP, a trip expense manager; CALC, a pocket-calculator emulator; and Autopen N&A, a form-letter and mailing label utility.

If interested, contact Chattanooga Systems Associates, P.O. Box 22261, Chattanooga, TN 37422, (615) 892-2339.

Circle No. 103 on RS Card

The Little Black Box



Tired of telecommunicating at 300 baud? Black Box Corporation is introducing its 1,200-baud modem at half the catalog price. Both versions of the Modem 1200, the Auto-dial Modem 1200 at \$279 and the Manual-dial at \$249, are fully Bell 103/212A-compatible and will work with your Model 100.

The auto-dial unit stores in non-volatile memory up to 20 telephone numbers. These are called up by alphabetic names, so reaching often-used services is simple.

For more information contact Black Box Corporation, Box 12800, Pittsburgh, PA 15241, (412) 746-5500.

Circle No. 104 on RS Card ☐

CELESTIAL SOFTWARE

Astro

Loquor Enterprises
3 Heneage Lane, Hanover, NH 03755
16K minimum RAM; 32K RAM for best results
\$39.95

By ALAN L. ZEICHICK

Have you ever wanted to find Saturn in your night sky? Name the middle star in Orion's belt? See the stars visible at the South Pole?

The Astro program displays on your Model 100 screen any night sky from any point on Earth, given the time and date, latitude and longitude and minimum stellar brightness desired. Scores of planets and stars, including Halley's Comet, are available.

With Astro you can have either 65 or 180 celestial bodies available for viewing. To use 180 you need a 24K model 100. If you don't have that much memory you can use the 65-item data file. Don't be too concerned with this — the smaller data set, although more limited, is good for most applications.

TRADE-OFF CHOICE

Astro can be run four ways, depending on what you want and available RAM:

Way	RAM	Data	Bodies
1	32K	RAM	180
2	24K	Tape	180
3	24K	RAM	65
4	16K	Tape	65

It's a three-way tradeoff: free RAM, number of stars available and the inconvenience of loading the data from tape. But it's good that Astro gives you these choices and documents the set-up procedures for each.

USER'S GUIDE

The Astro user's guide is a well-written document which leads you through seven sections:

1. Introduction
2. Installing Astro (RAM requirements, tape backup, loading Astro and specifying the data set to be used)
3. Using Astro (Sky mode, Parameter

mode, description of the two halves of the screen)

4. Parameter details (changing the time and date, latitude and longitude, field of view, or minimum allowable brightness/magnitude and viewing a desired star)

5. Sky display techniques (identifying stars on the display)

6. Applications (finding your position, historical astronomy)

7. Implementation details (stars and planets, possible errors and references).

There is also one appendix, which lists the names of all bodies in the 65- and 180-body data files. This appendix is exceptionally useful since to locate a star or planet you must type in its name exactly, even to upper- and lower-case. Would you rather remember the spelling of Miaplacidus and Muhlfrain?

STARGAZING

Astro divides the Model 100 display into two sections with Parameter mode on the left and Sky Mode on the right.

Parameter mode lists such items as date and time, longitude and latitude, field of view and azimuth.

The sky display section of the screen is just that — roughly two-thirds of the LCD display, with individual pixels set for stars or planets. There is also a block cursor which you can move from star to star.

The program has two running modes, Parameter and Sky. In Parameter mode you move the cursor over the different parameter fields, changing those you choose. For example, you can set the current time and date, your own latitude and longitude, and the altitude to 90. When you press Return the sky display will show what you'd actually see if you looked straight up. Not bad!

Once set, leave the latitude and longitude fields alone, unless you are doing more than simple stargazing. Changing the field of view value changes how much of the sky is being shown. It takes a little playing with this value to get a recognizable sky. I've found that a field of 25 degrees shows one whole constellation. I'd recommend using that value until you become familiar with the program.

SKY'S THE LIMIT

One of Astro's most useful features is its identification field. Just type in the name of the planet or star you want, such as Mars or Halley, and press Return. ZAP! The sky display shows that body centered on the screen. And on the left side of the screen, the magnitude, azimuth and altitude values are changed to reflect the exact values of that body.

You can move the cursor into the sky display section of the LCD which puts you in Sky mode. You can use this to identify certain stars. Just move the cursor onto one star, and press Return. Its name and characteristics will appear on the left parameter table.

Sky and Parameter modes combined are very powerful, and can help you find interesting information about the stars and constellations.

BUCKLE DOWN

To find the name of the middle star in Orion's belt, load Astro, but leave the default latitude and longitude alone.

Set the FV (field of view) to 25 degrees. Press Return and wait a few minutes for Astro to initialize.

Look on the last page of the user's guide to find some star in the constellation. We have Delta Orionis (d Orionis) and Iota Orionis (i Orionis) to choose from. Try the first: type d Orionis into the ID field on the left side of the screen. Press Return. In a minute, the 100 will beep and the stellar coordinates and magnitude of Delta Orionis will appear on the parameter display.

That star's a bright one, with magnitude 2.5. Let's change that to 9.5 so that our display will show all known stars in that constellation. Press Return again.

Ah! Now the star map of Orion will appear. Look familiar? The cursor will be on the right-hand star of the Belt. That's Delta Orionis. Move the cursor so it's on the middle star and press Return. After the 100 beeps look at the parameter ID field: it displays Alnilam, and that's the star in the center of Orion's belt.

SEE IT ALL

Astro is a great example of what computer software should be: fun, educational and easy to use all at the same time. If

REVIEWS

you secretly want to be an astronomer, or fantasize about being the navigator on a starship, this one's for you.

A warning, though. The Astro user's guide clearly states this program should not be relied on for nautical navigation purposes. It might be fine for approximations but you should use the nautical almanac so as not to get lost at sea. □



History 17B: An Introduction to Modern Entrepreneurship

The Computer Entrepreneurs: Who's Making it and How in America's Upstart Industry

Robert Levering, Michael Katz and Milton Moskowitz
New American Library
1633 Broadway
New York, NY 10019
491 pages
\$12.95, hardbound

Up and Running: Adventures of Software Entrepreneurs

Charles "Ed" Sherman
Ashton-Tate
8901 So. La Cienega Blvd.
Inglewood, CA 90301
312 pages
\$15.95, paperback

By JOHN P. MELLO JR.

When someone makes a lot of money very fast, everyone's interested in how. At least that's what the authors of these books are banking on.

Computer Entrepreneurs is a who's who — and how — of the computer industry. Up and Running seeks to reveal what it takes to make a bundle in the software business.

The New American Library book is an impressive achievement. In addition to thorough research into the backgrounds of each of their subjects, the authors interviewed each entrepreneur — a difficult task when you consider the demands these movers and shakers have on their time. Entrepreneurs interviewed by the authors include Nolan Bushnell, Jack Tramiel, Chuck Peddle, Bill Gates, George Tate and Regis McKenna.

VITAL STATS

The book's material is enhanced by its design. Each chapter begins with a list of vital statistics on the entrepreneur: best known venture, born, raised, father's occupation, first dollar earned, schooling,

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REVIEWS

original financing, home, family and personal transportation.

Information is also included about the entrepreneur's firm: company, best-known products, year founded, employees, headquarters, sales and ownership. With this data are presented a pen-and-ink caricature of each individual and a provocative quote in large type.

Scattered throughout the book are short sections highlighting interesting aspects of the entrepreneurs considered as a group. Details include how many are pilots or HAM radio enthusiasts, what colleges they attended and amusing anecdotes.

The book also contains an index that helps make it a valuable reference tool.

THE BEST INTENTIONS

In the preface to *Up and Running*, the author admits his intention was to write a book about how to make a pile of smackers from writing software. But somewhere along the line, the book's focus changed. That's apparent from reading the final product.

The book is unfocused. (The second chapter is an appendix!) The author appears to recognize this and tries to sal-

vage the mess by writing a bail-out epilog telling us what we should have learned in the preceding 300 pages.

The author intersperses his views on software with interviews with key people in the industry, including Microsoft founder Bill Gates and Mitch Kapor of Lotus Development Corp. Each question is printed in bold type with the responses duplicated verbatim. This makes for long, boring interviews.

FEAR OF LIBEL PARALYZES

It's as if the author were afraid to quote the subjects for fear of being accused of misrepresentation.

This is understandable. The author's publisher is a software house that competes with some of the firms the subjects work for. This is a sufficient basis for some of the interviewees to look on the project with suspicion.

One subject — David Rodman, whose firm (DJR) developed the first relational data-base manager for a microcomputer — refused to send a photo of himself to the author after discovering that one of his competitors was publishing the book. And Mitch Kapor originally refused to be interviewed on the same grounds.

While the material in *Computer Entrepreneurs* is either fresh or treated in a fresh way, *Up and Running* suffers from a lack of editing. And its old material — most notably a series of speeches delivered at a 1983 trade show — is also unenlightening.

DETRACTIVE DESIGN

Ordinarily, a book's design is almost invisible to the reader. Not so with *Up and Running*. Its design is so intrusive you've got to notice it. And what you notice is that it contributes to the book's confusion.

The chapter headers printed on every right-hand page are so large it's hard to tell if a new chapter is beginning or if you're in a subsection of the last chapter.

And the photographs, especially in contrast to the art in *Computer Entrepreneurs*, are so small they detract from the aesthetic quality of the book.

Whether you're just looking for a good read or you need a good reference work on the major figures in the microcomputer industry, *Computer Entrepreneurs* is for you.

As for *Up and Running*, it may contain the nuggets needed to make a million in software — but I couldn't find them. □

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```

10 *****
20 *
30 *   Program Proofer   *
40 *
50 *****
60
70
80 *** Initialize ***
90 DEFINT A-Y
100 ON KEY GOSUB 1740
110 KEY (1) ON
120 ON ERROR GOTO 1670
130 DIM WRD$(26,30)
140 DIM PAR$(30),BAD$(200)
150 GOTO 200
160 A$=INKEY$:IF A$="" GOTO 160
170 RETURN
200 REV$=CHR$(27)+CHR$(112)
210 FF$=CHR$(27)+CHR$(113)
220 CLS
300 PRINT TAB(9)"Automatic Programmer"
310 PRINT TAB(9)"PROGRAM PROOFER"
320 PRINT TAB(9)"By: David D. Busch":PRINT:PRINT
330 TAB(12);REV$;"Hit any key";FF$
340 IF INKEY$="" GOTO 330
350 CLS
360 CLOSE
370 PRINT:PRINT
380 *** Input filename to be proofed ***
390 PRINT TAB(2);REV$;"ENTER FILENAME :";FF$:PRINT TAB
(2)";:LINE INPUT F$
400 FOR N=1 TO LEN(F$)
410 T=ASC(MID$(F$,N,1))
420 IF T>96 AND T<123 THEN MID$(F$,N,1)=CHR$(T-32)
430 NEXT N
440 IF LEFT$(F$, 4)=""HELP" OR F$=""H" THEN GOSUB 1870
450 IF LEN(F$)>12 THEN PRINT"File name too long!":PRINT:GOTO
370
460 S9=INSTR(F$,".DO")

```

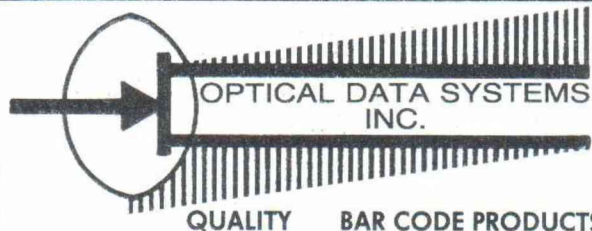
sible to decipher. After the program is running properly, you can run one of the many available "packer" utilities to compress it and save RAM space. Program Proofer works only on unpacked programs.

MATCHMAKER

When asked for the target program name enter the file specification of the ASCII-format program. Each line will be examined separately and all words not included within quotation marks compared with the internal dictionary. If a match is not found the questionable word is stored away for later reference.

The number of parentheses is counted and any missing or extra noted. Program Proofer also will locate absent quotation marks and list all the variables used in the program. Line numbers are provided to make corrections easier.

Here briefly is how Program Proofer works. The 102 keywords are stored in a string array, WRD\$(26,30). Each of 26 rows in the array corresponds to one of the 26 letters of the alphabet. The 30 columns allow for up to 30 keywords beginning with that letter. For example, ABS is stored in WRD\$(1,1), while AND



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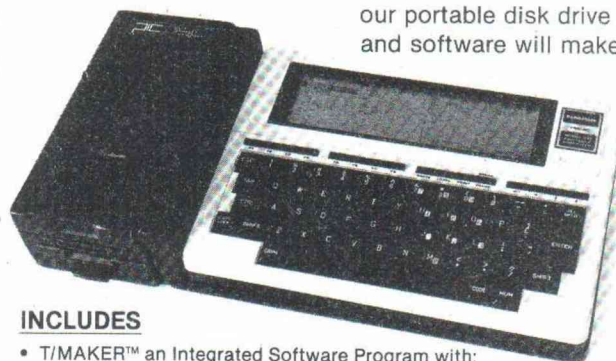


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RS41



is placed in WRD\$(1,2).

This is accomplished in a FOR-NEXT loop beginning at line 770. Each keyword is read from a data line and its first letter is examined to determine the ASCII value. Subtracting 64 determines the alphabetic position and the corresponding ROW of WRD\$(row,col). CDBL, which begins with C (ASCII 67), is directed to Row 3 (67 minus 64). The column is determined by a counter — A — which is incremented every time a new keyword is READ and reset to one each time a new ROW is opened (A2 <> PREVIOUS).

EXPAND YOUR VOCABULARY

If you want to include new BASIC keywords, Program Proofer can be updated to use them. Add the word to its proper position in the DATA lines and change the 102 to the new number of keywords. If any letter of the alphabet now has more than 30 keywords, it will be necessary to reDIMension WRD\$(row,col).

The target program (F\$) is OPENed and a line at a time is read into the variable A\$. The first space in the program line is assumed to follow the line number. The rest of the line is stored in SEG\$. A FOR-NEXT loop examines in turn each character in the program line.

```
450 IF LEN(LEFT$(F$,S9))>6 THEN PRINT "File name too
long!":PRINT:GOTO 370
460 IF S9=0 THEN PRINT "MUST INCLUDE .DO EXTENSION!":GOTO 370
470 IF F$="" GOTO 370
480 OPEN F$ FOR INPUT AS 1:RESTORE
490 DATA ABS,AND,ASC,ATN,BEEP
500 DATA CALL,CAS,CDBL,CHR$,CINT
510 DATA CLEAR,CLOAD,CLOAD?,CLOADM
520 DATA CLOSE,CLS,COM,CONT,COS
530 DATA CSAVE,CSAVEM,CSNG,CSRLIN
540 DATA EOF,EQV,ERL,ERR,ERROR,EXP
550 DATA FILES,FIX,FOR,FRE,GOSUB,GOTO,HIMEM
560 DATA IMP,INKEY$,INP,INPUT,INPUT$,INSTR
570 DATA INT,IPL,KEY,KILL,LCD,LCOPY
580 DATA LEFT$,LEN,LINE,LIST,LLIST
590 DATA LOAD,LOG,LPOS,LPT,MAXFILES
600 DATA MAXRAM,MDM,MENU,MERGE,MID$,MOD
610 DATA MOTOR,NAME,NEW,NEXT,NOT,OFF
620 DATA ON,OPEN,OR,OUT,PEEK,POKE,POS
630 DATA POWER,PRESET,PRINT,PSET,RAM
640 DATA RIGHT$,RND,RUN,SAVE,SCREEN
650 DATA SGN,SIN,SOUND,SPACE$,SOR,STOP
660 DATA STR$,STRING$,TAB,TAN,TIMES
670 DATA USING,VAL,VARPTR,XOR
680 CLS:PRINT:PRINT
690 PRINT TAB(2)"THIS WORKS ONLY ON FILES"
700 PRINT TAB(2)"SAVED IN UNPACKED AND .DO FORM"
710 PRINT
720 PRINT
730 PRINT TAB(4)"-- A few seconds please --"
740 ' *** Read GOOD names into array ***
770 : FOR N=1 TO 102
780 :   READ D$
790 :   D2=ASC(LEFT$(D$,1))-64
800 :   IF D2<>PREVIOUS THEN PREVIOUS=D2: D=1
810 :   WRD$(D2,D)=D$
820 :   D=D+1
830 : NEXT N
840 PRINT:PRINT
850 CLS:PRINT:PRINT
860 PRINT TAB(4):REV$:" -- Reading in Program Lines -- ";FF$
```



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"We really enjoy writing on the Model 100 and transferring files to the MicroMate." User's Guide review article in Vol.1 no.5, 1984.

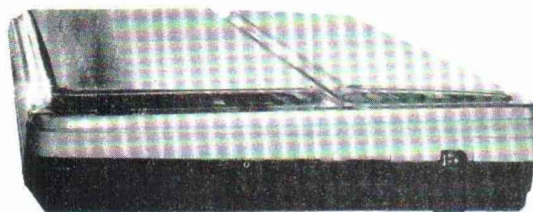
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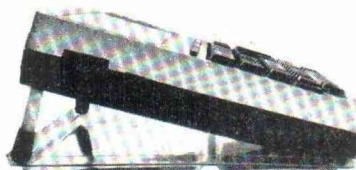
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```

870 PRINT
890 IF EOF(1) THEN 1310
900 LINE INPUT #1, A$
910 TEST$=""
920 PRINT A$
930 FL=0
940 SFLAG=0
950 P=INSTR(A$, CHR$(32))
960 SEG$=MID$(A$, P+1)
970 L=LEN(SEG$)+1
975 ' *** Check for keyword delimiter ***
980 : FOR N1=1 TO L
990 :   M$=MID$(SEG$, N1, 1)
1000 :   IF SFLAG<>1 THEN 1020
1010 :   IF M$=CHR$(34) THEN 1050 ELSE 1230
1020 :   IF M$=")" OR M$="+" OR M$="-" OR M$=CHR$(32) OR
M$="=" OR M$="\" OR M$=CHR$(34) OR M$="," OR M$=":" OR M$="<" OR
M$=">" OR M$="#" OR M$="/" OR M$="*" OR M$=CHR$(10) OR M$="\"
THEN 1050
1030 :   TEST$=TEST$+M$
1040 :   GOTO 1230
1050 :   IF SFLAG=1 THEN SFLAG=0: TEST$="": GOTO 1230
1060 :   IF M$=CHR$(34) THEN SFLAG=1: IF MID$(SEG$,
N1-1,1)=CHR$(32) THEN TEST$=""
1070 :   IF M$="(" THEN LP=LP+1
1080 :   IF M$=")" THEN RP=RP+1
1090 :   FL=0
1100 :   IF TEST$="" THEN 1230
1110 :   IF TEST$="REM" OR TEST$="\" THEN 1240
1120 :   IF VAL(TEST$)>0 THEN TEST$="": GOTO 1230
1130 :   A=ASC(LEFT$(TEST$, 1))
1140 :   IF A<65 OR A>90 THEN TEST$="": GOTO 1230
1150 :   A=A-64
1160 :   FOR N2=1 TO 30
1170 :     IF WRD$(A,N2)=" THEN FLAG=0: N2=30: GOTO 1210
1180 :     IF TEST$=WRD$(A,N2) THEN FLAG=1: N2=30: GOTO 1211
1190 :   NEXT N2
1200 :   FLAG=D
1210 :   IF FLAG=0 THEN NU=NU+1: BAD$(NU)=TEST$+" : LINE
"+LEFT$(A$, P)
1220 :   TEST$=""

```

When certain delimiters are reached the program assumes the end of a word or variable has been located. These delimiters include: spaces, quotation marks, commas, semicolons, parentheses, colons and arithmetic symbols. Control then goes to a subroutine where that portion of the line — TEST\$ — is subjected to a series of tests.

If TEST\$ "" (null) or the VALue of the first character is greater than zero (signifying a number), then the program jumps back and begins looking at the next section of the program line. Keywords or variables beginning with a number will not be found. When a REM is encountered the rest of the program line is ignored.

Once TEST\$ completes these checks, it enters another FOR-NEXT loop that compares TEST\$ with the elements of WRD\$(row,col) beginning with the same letter of the alphabet as TEST\$. If a match is found, FLAG is set to one. Execution then branches to line 1210 where the counter NU is incremented and the suspect word is stored in string array BAD\$(n) along with its line number.

The rest of the line is examined next for additional statements, variables and keywords.

IT'S HERE!

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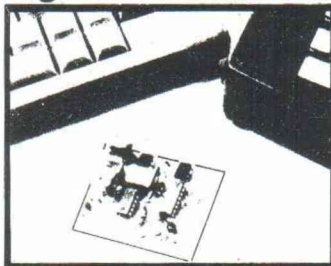
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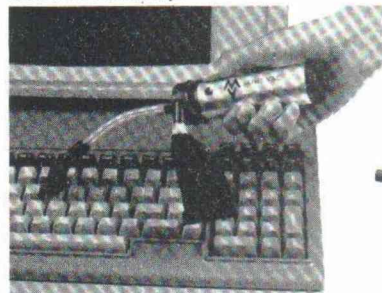
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RS21



```

1230 : NEXT N1
1240 IF RP=LP THEN 1290
1250 N1=N1+1
1255 ' *** Paren missing ***
1260 PAR$(N1)="LINE " +LEFT$(A$,P)+" : MISSING "
1270 IF RP>LP THEN P$="LEFT" ELSE P$="RIGHT"
1280 PAR$(N1)=PAR$(N1)+P$+" PARENTHESIS"
1290 RP=0:LP=0
1300 GOTO 890
1305 ' *** Display results ***
1310 CLS:PRINT:PRINT
1320 PRINT "Do you want output to go to printer?"
1330 GOSUB 160
1340 IF A$="Y" OR A$="y" THEN PFLAG=1
1350 GOSUB 1610
1360 ZU=1
1365 ' *** Show BAD words and Variables ***
1370 : FOR N4=1 TO NU
1380 : IF ZU MOD 16=0 THEN GOSUB 1570
1390 : IF BAD$(N4)=BAD$(N4-1) THEN 1430
1400 : PRINT BAD$(N4)
1410 : IF PFLAG=1 THEN LPRINT BAD$(N4)
1420 : ZU=ZU+1
1430 : NEXT N4
1440 GOSUB 1570
1450 Z3=1
1455 ' *** Show Missing Parens ***
1460 : FOR Z3=1 TO N1
1470 : IF Z3 MOD 16=0 THEN GOSUB 1570
1480 : PRINT PAR$(Z3)
1490 : IF PFLAG=1 THEN LPRINT PAR$(Z3)
1500 : NEXT Z3
1510 PRINT
1520 PRINT "-- END OF LIST --"
1530 PRINT
1540 PRINT TAB(2);REV$;"HIT ANY KEY TO RE-RUN PROGRAM";FF$
1550 GOSUB 160
1560 GOTO 340
1570 PRINT
1580 PRINT TAB(11);REV$;"HIT ANY KEY";FF$
    
```

MAY I QUOTE YOU?

Anytime a quotation mark is encountered, SFLAG is set to one and the following characters on that line are ignored until a second quote is found. Missing quotation marks will stand out like a sore thumb. There's no specific check for them but words that should be inside prompts are listed as bad.

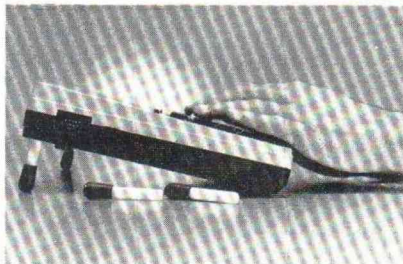
A check is included for absent parentheses, however. Each right parenthesis encountered in a program line increments variable RP, while left parentheses increase the value of LP. After the whole program line has been checked, Program Proofer compares LP and RP. If they don't match, then the line in which the error appears is stored in the string array PAR\$ along with a note telling which parenthesis is missing.

In rare situations when one statement is missing a left parenthesis while another statement later in that line is missing a right parenthesis, the LP and RP will match and the error will not be caught.

PUTS IT IN WRITING

When the end of file (EOF) marker is encountered, the user is asked if results should be directed to a printer as well as

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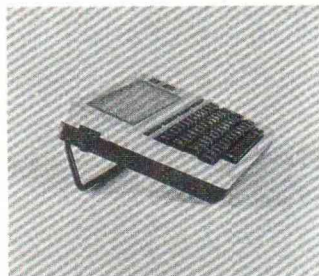
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BUG BUSTER

to the screen. The suspect words are then listed in groups of 11 words per line.

A counter — CU — keeps track of how many words are printed or listed. If a variable or bad word appears several times in a single line, it is mentioned just once. When CU can be evenly divided by 11, the program branches to a paging subroutine at line 1570.

Once the variables and bad words are listed the program displays all the lines that contained missing parentheses.

A number of enhancements are possible. For example, the program can be extended to check each variable against the keyword list, using INSTR, to see if any have inadvertently included a non-allowable keyword.

Checking the spelling of a computer program is easier than proofreading a document because the number of legal words is limited. Once a computer is told which words are allowable, it's a simple matter to allow it to help with the debugging process. □

Please help us rate this article's overall value. If you found it very valuable, circle 130 on the reader service card. If it was moderately valuable, circle 131 — and if it wasn't valuable to you, circle 132.

```

1570 GOSUB 160
1600 RETURN
1610 CLS:PRINT:PRINT
1620 PRINT
1630 PRINT
1640 PRINT REV$;" * POSSIBLE MISPELLINGS AND VARIABLES *":FF$
1650 PRINT
1660 RETURN
1665 ' *** Error Trap ***
1670 IF ERR<>52 GOTO 1740
1680 CLS:PRINT:PRINT TAB(2)"==> ":FF$
1690 PRINT TAB(2);REV$;"THAT FILE DOES NOT EXIST!":FF$
1700 FOR N9=1 TO 2000
1710 NEXT N9
1720 CLS
1730 RUN
1740 IF ERR=5 THEN PRINT TAB(2)"PROGRAM WRONG FORMAT!":FOR N9=1
    TO 2000:NEXT N9:RUN ELSE PRINT:PRINT
1750 PRINT "***** UNKNOWN ERROR *****"
1760 PRINT "IN LINE ":ERL
1770 FOR N9=1 TO 500
1780 NEXT N9
1790 RESUME 340
1800 CLS:PRINT:PRINT
1810 RETURN
1820 PRINT
1830 PRINT "Hit any key to resume program"
1840 GOSUB 160
1850 RETURN
1860 GOSUB 1800
1865 ' *** Help Routine ***
1870 CLS:PRINT
1880 PRINT "Program wants the name of file to be"
1890 PRINT "proofread. Must be a legal Basic "
1900 PRINT "name, or your input will be rejected"
1910 PRINT
1920 LINE INPUT"ENTER FILENAME ":F$
1930 RETURN
1940 CLOSE
1950 END

```

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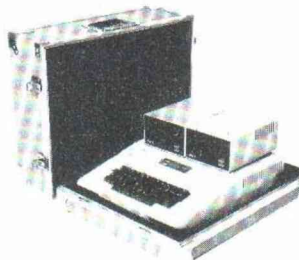
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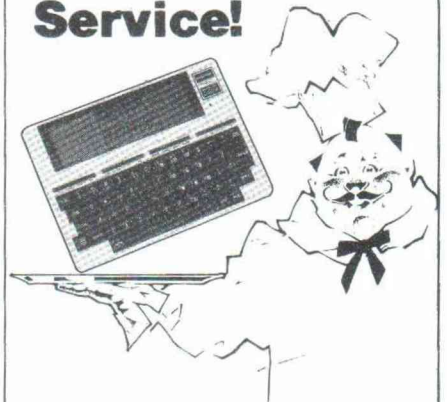
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Software for
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NEC PC 8201A



THE WIRE (from page 29)

100 Earns Cum Laude Degree

A pilot study currently underway in a New York City high school may lead to new applications for the Model 100 in the field of computer-assisted education for the handicapped.

Physically handicapped students at Susan E. Wagner High School are being loaned 100s to supplement their instruction in math, English, computer science and other topics. The portables complement Radio Shack Color Computers that are used within the classroom.

The pilot program is part of the high school's efforts to conform with Public Law 94-142, which requires that each state provide educational opportunities to handicapped students. As part of its contribution, Tandy is providing free computer instruction to the families of handicapped students through its Radio Shack stores.

The 100s and Color Computers are being used in a variety of ways. For some students, the fundamentals of computer operation—care of the computer and peripherals, the ability to refer to the owners' manual, loading and running programs—provide valuable training.

Other students perform word processing, database management, spreadsheet analysis and telecommunications tasks.

The 100's inherent programability makes it a valuable resource in special educational programs. P.L. 94-142 requires an individualized education plan (IEP) for each handicapped student. The IEP is a custom-tailored curriculum designed to help each student maximize his or her performance.

With custom software, the 100 can respond to the student's commands and input data according to teacher-specified criteria. "At best," summarizes a New York City Board of Education account of the project, "the system provides feedback in highly motivating sound and graphics, with correction instructions. For handicapped children, computers have the potential to deliver instruction matched to the goals and objectives indicated on each child's IEP."

Courseware developed for the study includes drill, simulation and tutorial applications. In addition, project coordinators have developed hardware modifications that increase the 100's usefulness, including a wheelchair lap board. Tandy is supplying several working prototypes of the board at no charge to the district.



Eleventh grader Maria Dellarocca is confined to a wheelchair. But in a special class for handicapped students, teachers like Frantz Wade are showing physically disabled students how the 100 can be a learning tool.

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The service, which is available around the clock, costs \$15 per month plus \$1 per minute for connect time. Information may be downloaded to your 100; alternately, you can request a printout. The cost is 10¢ per record printed.

For more information contact American Business Lists at (402) 331-7169. □





NEC 32K *VS.* SIDECAR 128K

Up To 192K Of Memory On-line For Your NEC PC-8201 Means Goodbye To Unreliable Cassettes, And Bulky Disk Drives.

The problem with most portables is utility gets sacrificed for portability. Only being able to take 32K of files with you is a real pain. Things like form letters, data bases, spreadsheet layouts, and other files have to either be left behind or you have to mess with external storage devices. The inconvenience of having to bring along cassette players, and disk drives (not to mention the hassle getting them to work) can make you wonder why you brought this "productivity tool" in the first place.

THE NEC SOLUTIONS

The NEC PC-8201 has two solutions for this problem. First it has the ability to house up to 64K of RAM inside the machine. Through a technique called "bank switching" you can access up to three different 32K "banks" of memory: two inside the computer and one in a plug-in cartridge. This is a big improvement. But the problem here is each additional 32K cartridge from NEC costs \$395.

PURPLE'S SOLUTION

Many of you will remember us as the first company to manufacture an aftermarket 8K memory module for installation inside the computer. This product was so successful that other companies copied it. Our customers

kept asking for more storage, and the result is our SideCar™. It uses a bank switching system similar to NEC's to let you access up to *four additional banks of 32K, giving the NEC PC-8201 up to 192K of on-line memory!* Now there really is a portable computer of amazing proportions.

THE PORTABLE SOLUTION

Now you can have gobs of data instantly available at the flick of a switch. The SideCar™ plugs into the NEC PC-8201 in the same slot the NEC 32K cartridge uses. The memory is powered by two standard size AA batteries when the computer is not in use. You can even change the batteries without losing the data. SideCar™ comes standard with 32K of memory, with up to three additional 32K modules available giving it a total capacity of 128K. They are simple plug-in options so you can buy a 32K version now and add memory as needed. The batteries will support the memory for up to one year.

NO RISK OFFER

We give you a 30 day satisfaction guarantee and a 1 year warranty on your SideCar™. If you are not completely satisfied for any reason, we will refund the entire amount of your

purchase. If at any time during the one year warranty period your SideCar™ requires service, we will fix or replace it within 48 hours.

THE BOTTOM LINE

The basic 32K SideCar™ with 32K in bank 1, expandable to 128K, is \$199 (Part #SC32). User installable 32K banks are \$100 for bank 2 (Part #SCB2), and \$110 each for bank 3 and 4 (Part #SCB34). If ordered together the banks are installed and tested at the factory.

Price includes shipping, and insurance in the continental USA. Your SideCar™ will be shipped the next business day via UPS surface freight. If you want 2nd day air service, just add \$4. No extra charge for VISA/MasterCard, or American Express. For fastest delivery send certified checks or credit card. Calif. residents add 6% sales tax. Personal checks take 3 weeks to clear. Call for purchase order information.

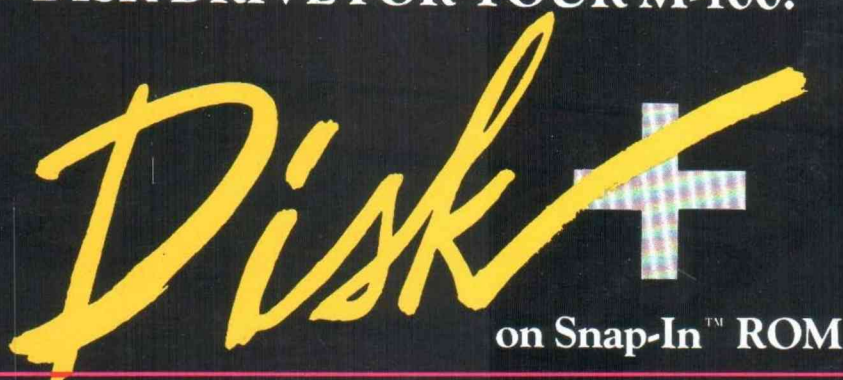
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When we designed *Disk+* we did it out of necessity. We wanted a way that we could just connect a Model 100 to our desktop computer with a cable and save files onto the desktop's disk drive. We wanted it to be so simple to use it would be self-explanatory.

Picture this. *Disk+* comes to you on a Snap-in ROM and a diskette for your desktop. You take a quarter and open the little compartment on the back of your Model 100. Then you just press the ROM into the socket. *Disk+* appears on your main menu just like a built-in.

You connect your Model 100 to your other computer using an RS232 cable (available from PCSG for \$40).

You just place the *Disk+* diskette into the desktop's drive and turn on the computer. It powers up automatically and says "awaiting command" on your desktop's screen. Then you just put the widebar cursor on the Model 100 main menu on *Disk+* and press ENTER. You are shown your RAM files arranged just like the main menu.

To save a file to your other system's disk drive, you just move the widebar cursor to the file you want to save and press ENTER. It is saved instantly with no further action.

To look at the disk directory, you just press a function key on your Model 100. You see immediately the disk directory on your Model 100 screen, and it is arranged just like your Model 100's main menu.

To load a file from the diskette to your Model 100, you just move the widebar cursor to the file and press ENTER. The file is transferred to your Model 100's RAM instantly. You can press F8 and go back to the main menu, and the file you loaded from diskette is there, ready to use.

It is so nice to be able to keep your documents, programs (both BASIC and machine code) and *Lucid* spreadsheet files on the diskette, and bring them back when you need them. All files are ready to run or use with no changes or protocol by you.

If you have access to a desktop computer and don't have *Disk+*, then evidently we have done a poor job telling you about it.

All files and programs that you load or save, go over and come back exactly as they are supposed to be because of full error checking. This guaranteed integrity is really a comfort. *Disk+* is wonderful in so many other ways. For example, you can do a "save all" of all your RAM files with just a touch of a function key. That group of files is saved on the diskette under a single filename with a .SD (for subdirectory) extension. Any time you want, you can bring back all those files at once, or just one or two if you like, again with one-button ease.

Disk+ takes up no RAM. That's zero bytes either for storing the program or for operating overhead.

What really excites most *Disk+* users is text file cross compatibility. Your Model 100's text files are usable on your desktop computer, and your desktop's text files become Model 100 text files.

This means you can write something on your Model 100, and with *Disk+* transfer it

instantly to your desktop and start using it right away on your bigger computer. Or the way we like to work is to type in a document on the desktop computer and then transfer it to our Model 100 with *Disk+*. Then we print out the document, beautifully formatted, using WRITE ROM.

Disk+ works with just about every micro sold, from IBM PC and its clones, to all Radio Shack computers (yes, all), to Apple II, Kaypro, Epson and most CPM. Just ask us. More than likely, your computer is supported.

Incidentally, hundreds of Model 100 owners have gone to their Radio Shack stores and bought a color computer because it is so low priced, and with *Disk+* they have an inexpensive disk drive.

And if that weren't enough, how about this: *Disk+* also provides cross-compatibility between different computers like IBM, Apple or the Model 4 using the Model 100 as the intermediary device. Quite a feature!

The snap-in ROM is really great because you can use other ROMs like *Lucid* or WRITE ROM. They snap in and out as easily as an Atari game cartridge and you never lose your files in RAM.

Anyone who ever uses *Disk+* simply can't do without it. But so many times we have had new users call us and say, "Wow! I had no idea when I ordered it that *Disk+* would be so fantastic. I just couldn't believe that I could use my desktop computer's disk drive with my Model 100 just like it is another main menu."

That's why we sell *Disk+* on a thirty-day trial. If you aren't completely satisfied, return it within thirty days for a full refund. Priced at \$149.95 on Snap-in ROM. MasterCard, Visa or COD.

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PORTABLE COMPUTER SUPPORT GROUP

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